Warning: this product relies on Windows 3.x which is not Y2K compliant.

Access System 2000

Access Manager 2000 User Manual

Assembly Part Number 896-502037-001-A
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VERILINK

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Important Notice

Before performing any operations, PLEASE READ AND UNDERSTAND ALL INSTRUCTIONS IN THIS MANUAL.

WHEN YOU ARE FINISHED, PUT THIS MANUAL IN A PROMINENT LOCATION; DO NOT THROW THIS MANUAL AWAY, unless it is being replaced by a corrected or updated manual.

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The Federal Communications Commission (FCC) Rules require that you be notified of the following:

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this reference, can cause interference to radio communications.

This equipment has been tested and found to comply within the limits for Class A devices pursuant to Subpart J of Part 15 of the FCC rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Operation of this equipment in a residential area is likely to cause interference, in which case the user(s) will be required to take whatever measures (that can be) required to fix the interference at their own expense.

Per FCC Part 68 requirements, the customer is required to notify the Telephone Company prior to disconnecting this unit from the network interface.

The FCC registration number for Access System 2000 is GICUSA-18804-DE-N.

Access Manager 2000 Software Package

Product Support Information

The Access Manager 2000 Software Packages (AM2000-8, AM2000-24, AM2000-1000) purchased under a master license agreement allow the customer to monitor up to eight (8), twenty-four (24), or unlimited number of DS1 circuit elements. A circuit element is defined as a single ESF DS1 interface device such as an ESF CSU (Extended Superframe Channel Service Unit).

Under this agreement, a master licensee is entitled to customer support, maintenance, and service, as specified below.

Training	Customer training is available at the San Jose (California) Verilink facility or at the customer's site. For course fees and a current training schedule, please contact Verilink at 1-408-945-1199.
Telephone Support	Telephone Hotline support is available through Verilink's Technical Assistance Center (TAC) twenty-four hours a day, seven days a week. Verilink provides a toll-free number 1-800-543-1008 answered directly during normal business hours (8AM to 5PM Pacific Standard Time, Monday through Friday except holidays). Calls received outside of our normal business hours will be answered within one hour by a Verilink Technical Assistance Engineer.
Maintenance	A software maintenance contract can be purchased to allow the customer to obtain periodic updates of the Access Manager 2000 software. Please call Verilink's Technical Assistance Center (TAC) for details of the software maintenance contract.

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Preface

Using This Manual

Targeted audience

This introduction tells you how to use this manual and describes its conventions. It also summarizes the contents of the manual, describes revisions and equipment changes, and lists all related Verilink manuals.

What's in this Manual?

This manual has been organized to provide you with a progressive understanding of the Access Manager 2000 service and equipment you'll be using.

Use the *Table of Contents* and *Inde* first. Look up the pages where the information appears, and read the relevant sections before entering anything on the keyboard.

For an installation or general operating procedure, begin with the procedures in *Chapter 2, Installing Access Manager* and *Chapter 3, Using Access Manager*. Follow the instructions in these chapters, which may refer you to further instructions in other chapters.

Whether you're a novice or experienced user, don't start in the middle of a procedure. However, if you are in the middle of an operation and are about to choose an option, or have been working without the aid of this manual, it is still important to find the starting point of the relevant procedure and read each of its steps to be sure you have not skipped any important items.

When procedures have many steps, each step is numbered in the execution sequence as in the following example:

1. Starting from the *Main* Menu, select **`Configure`**.
2. When the *Configuration* Menu appears, select **`Node`**.

3. You have now completed this procedure.

The functional specifications of the various Verilink network access systems differ; consequently, Access Manager presents a different set of menus for each of the two different types of nodes.

These two types of nodes are:

- AS2000 type nodes (includes Access System 2000 and ConnecT1 Plus network management systems).
- 551VST type nodes (includes 551VST type Single-Line nodes; SIM, NC/E, 551VST ML List 1, and 551VST ML List 2 Multiline nodes).

This manual presents information through menu descriptions. Access Manager has two types of menus:

- The AS2000 type of menus reflect the functions of AS2000 and ConnecT1 Plus Nodes.
- The 551VST type menus reflect the functions of all other types of Nodes. The various configurations for both of these types of nodes are described in Chapters 2, 3, 4, and 5.

Chapters 6 through 8 provide reference, operations, and information. Each of these chapters addresses one of Access Manager's five primary menus: *Utilities, Configuration, Alarm Status, Database Access*, and *Online*. Once you have started a procedure (Chapter s4 and 5), use Chapters 5 through 9 for specific portions of the operation. If you are not sure how to select an option, go to the beginning of the operation in each section, where the instructions will guide you from the *Main* Menu.

If you have never used Access Manager, *Chapter 1, Access Manager Overview*, furnishes you with a quick overview.

Chapter 1

Access Manager Overview

Describes an overview of the functions, features, and operation of Access Manager. If you are a novice user, take time to read this chapter.

Chapter 2

Installing Access Manager

Provides instructions for installing the Access Manager software on an IBM PC AT or 100% IBM-compatible computer. It also outlines the controller and peripheral equipment requirements for using Access Manager.

Chapter 3

Using Access Manager

Provides the instructions for performing various Access Manager procedures including start-up, shut-down, and backup. This chapter also describes the command syntax and keyboard operations used in this manual.

Chapter 4

Configuring Access Manager

Provides a reference for the *Utilities* branch of the Access Mana ger2000 menu. *Utilities* includes setting up communication interfaces between the host PC, network elements, and peripheral devices. *Utilities* also administers Access Manager users, the system's event log, and downloading of Advanced Programmable Architecture (APA).

Chapter 5

Configuring the T1 Network

Provides a reference for the *Configuration* branch of the Access Manager 2000 menu. *Configuration* establishes the operating characteristics of the network elements (such as Channel Service Units [CSUs], Data Service Units [DSUs], etc.). The proper configuration of nodes, circuit elements, circuits, and routes is essential for proper network operation, monitoring, and testing.

Chapter 6

Alarm Reporting

Provides a reference for the *Alarm Status* branch of the Access Manager 2000 menu. *Alarm Status* manages the database of Access Manager alarm reports, including printing, archiving, viewing, and deleting these reports.

Chapter 7

Analyzing Performance Data

Provides a reference for the *Database Access* branch of the Access Manager 2000 menu. *Database Access* manages the records in which Access Manager has logged the performance data of the DS1 circuits it is monitoring. It also manages the analysis (with viewing and printing), archiving, and deletion of these records.

Chapter 8

Monitoring and Troubleshooting Access Manager

Provides a reference for the *On-line* branch of the Access Manag er2000 menu. *On-line* includes accessing circuit elements for their current status and configuration. Performance data which is held in registers of the circuit elements, but not yet stored in performance data records (Chapter 8), can be viewed, printed, and reset. Circuit testing options (including loopbacks) are controlled through the features in *On-line.*

Appendix A

Key Acronyms and Terms

This section provides a list of the key data communications acronyms and terms used in T1 service.

Appendix B

Modem Configuration

Describes the dial-up modem configuration required for operation.

Appendix C

Alarm Report Record Formats

Describes the alarm report record format.

Appendix D

Installing Serial Ports

Shows the installation of serial communication ports.

Appendix E

Archive FIle Formats

Describes the performance data archive file formats.

For information about Access Manag er2000 not covered in this manual, callVerilink Field Service, (408) 945-1199.

Summary of Access Manager changes

Following are the highlights of Revision 1.3 changes to Access Manager 2000.

1. Access Manager 2000 packages have been renamed:

Old Name	Old Capacity	New Name	New Capacity
Performance	14	AM2000-8	8
Insight	40	AM2000-24	24
Signature	unlimited	AM2000-1000	unlimited

2. Option for enabling and disabling the update of NCC (CCC) real-time clock when configuring the node or polling the node.

3. X.25PAD (Packet Assembler Disassembler) support for NCCs with Revision 4.22 or higher firmware. Verilink equipment has been tested extensively with the NET TX7000PAD.

4. Support for 9600 baud modem which adhere to the Hayes command set. For NCCs with Revision 4.22 or higher firmware.

5. Alternate Alarm Path functionality for nodes. Supported by assigning the Access Manager PC a Manager ID (identifier) in the *Utilities/Installation/Site* screen.

6. In CSU configuration, the PRM (Performance Report Message) option now supports SMDS (Switched Multi-megabit Data Service).

7. Support for TACs LOS of External Clock alarm. This is reflected in the *Online/Status-Element* and *Online/Circuit Status Diag* screens.

8. Access Manager will now track up to thirtee n DIU2130s (Data Interface Units) with tests in progress.

9. Loss of Signal (LOS) is now supported in the configuration screen for each data port. LOS can be programmed to occur on loss of DTR (Data Terminal Ready) or RTS (Request To Send).

10. Data port lead status is now reported to AM2000 from the *Online/Status-Element* and *Online/SelectTest/View Test Status Results* screens.

11. The DIU 2140 is now fully supported.

12. New alarms for AM2000 CSUs and DIUs

13. The transaction file (`INSTALL.LOG`) is now created in the destination directory during the install procedure. It contains information such as user-selected directories, disk space calculations, database revision, and any error messages that may have appeared. Please refer to this file when problems occur during the installation process.

Conventions used in this guide

This section defines conventions used in this manual.

The way text appears

The body text of this manual appears in Times regular (no bold, no italics) font. By varying the font and format, we emphasize important information. This section will provide you with a clear description of what the different formats mean.

Italicized and Bold Text

Italicized text and bold text is used to highlight key concepts or words which help you understand instructions or applications. See the following examples:

- Like a LAN (Large Area Network), SMDS is a ***connectionless service***.

Courier Bold Text

Courier bold text is used to identify fields or options, and any characters you need to type and enter. For example:

- Select **SMDS** and press Enter.

Special Symbols and Notices

Special symbols are used to draw your attention to particular kinds of information. All of these symbols are described in this section of the manual. Please read all of them carefully.

Instruction Symbol

The International Instruction Symbol is used in the left margin of the manual pages to point out important operating and maintenance (servicing) instructions.

Warnings and Cautions, particularly, use this symbol. Please read them.

Dangerous Voltage Symbol

The lightning flash with arrowhead symbol, within an equilateral triangle, alerts the user to the presence of uninsulated "***dangerous voltage***", within an enclosure, which may be large enough to constitute a risk of electric shock to persons.

Warnings and Cautions, particularly, use this symbol. Please read them.

Warning Notices

All Warning Notices indicate a possibility of severe injury, loss of life, or permanent equipment damage if the instructions are not followed. Depending on the specific content, Warning Notices may be offset by the *Instruction* or *Dangerous Voltage* symbol respectively. A Warning Notice appears in the following example:

WARNING

The DIU 2132 contains static-sensitive circuits. Before unpacking a DIU, wear an anti-static wrist strap, connected to frame ground, t prevent shock to yourself or damage to circuits from electrostatic discharge.

Caution Notices

All Caution notices indicate a possibility of equipment damage if instructions are not followed. Caution notices will be offset by the Instructions symbol. A Caution Notice appears in the example below:

CAUTION

Always insert and secure the connector module into the shelf backplane before inserting its circuit element. Failure to do so may cause equipment failure.

Notes

All notes provide useful information about Access System 2000 in general or about an operation. An example is shown below:

Note: *At this point, Access Manager does not poll the DIU 2132 for PLCP and L2_PDU performance data to deposit into the database*

Tips

Tips provide information which may simplify or expedite an operation. An example is shown below:

To disable alarm reporting during excessiveBPV, ES, or UAS errors, set their threshold values to ***0****.*

Check Boxes

Check boxes are used with checklists and sequential lists. Verilink recommends that you photocopy these lists and use them each time you attempt to execute a sequential operation.

A check box with a check mark indicates that the instruction may not be necessary or may have already been done earlier.

Check Box

Check Box with Check Mark

Other conventions

The following conventions are used to reference special keys, keystroke combinations, or other information:

- Special keystroke(s) combinations are shown as:

  <F5> or F5 (to press the F5 function key).

  <CTRL>-<PgUp> (to press and hold the CTRL key, and then depress the PgUp key).

- Some people are familiar with the <ENTER> key and some with the <RETURN> key to end the entry of one or more keystrokes. The designation <ENTER> is used throughout this manual.
- If a message appears on the screen, it is fully capitalized as follows:

  ... the message `NOT YET DEFINED` displays.

- All program and data file names are fully capitalized as follows:

  .. the `USER.KEY` file is copied.

- References to names of other chapters, sections, and menus are initial-letter capitalized and italicized as follows:

  ... refer to the *On-line* Menu

Additional reading

The manuals listed provide detailed information on the Verilink single-line and multiline DS1 (T1) network systems with which Access Manager interfaces. They can be ordered directly from Verilink.

Manual/Book Titles	Part Number
551VST List 1 CSU	880-500501-001
551VST List 1/A CSU	880-500501-001
551VST List 1/B CSU	880-500993-001
551VST List 2 CSU	880-501558-001
551VST MLB/MLE List 1 (NMS)	880-500543-001
551VST MLB/MLE List 2 (NMS)	880-500969-001
4016-R User's Manual	880-501713-001
Shelf Interface Module (SIM)	880-501048-001
Network Controller/Expansion (NC/E) Shelf	880-500987-001
NCC 2020 and TAC 2010	880-501522-001
DIU 2130 High-Speed Data Interface Unit	880-501520-001
DIU 2140 Subrate Data Interface Unit	880-501519-001
Access System 2000 Installation and Maintenance	880-501525-001
Access System 2000 Local Operations	880-501531-001
The Book on ESF, Verilink Corporation	-----
AT&T Publications	54016 54075 62411
ANSI Specifications	T1M1.3 T1.403
pcANYWHERE III Software Users Manual	-----
AT&T Accumaster Manuals	-----

Chapter

1

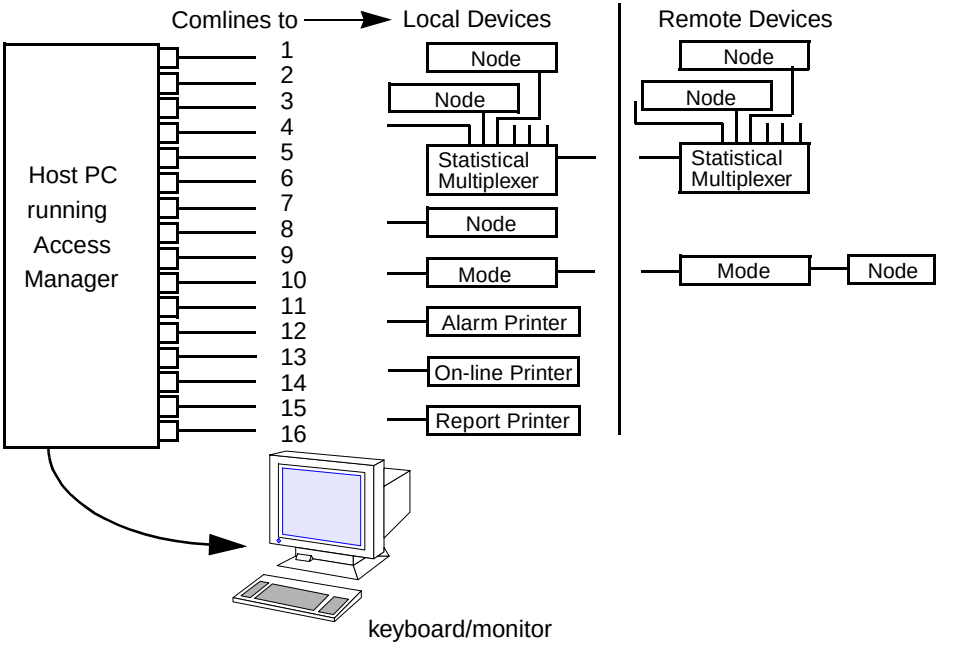
Access Manager Overview

This chapter describes the functions and features of Acces sManage r2000.

Functions

Access Manager 2000 is an IBM PC-based (or 100% IBM-compatible) software program that allows you to perform numerous administrative operations on a DS1 (T1) transmission network. Figure 1 -1, "Access Manager 2000 set up", illustrates how the host computer connects to the local devices which, in turn, are connected to the remote devices through a DS1 (T1) network.

Figure 1-1 Access Manager 2000 set up



You can set up Access Manager to meet your specific network needs. For example, you can edit the system date and time, add users and passwords to the system, define the Access Manager communication ports and data/report printers, and establish the performance data collection parameters (i.e., define polling hours and allocate database storage space).

Network Configuring

Through Access Manager, you can configure Verilink DS1 (24 channels), DS0 (single channel), and subrate circuit elements for proper operating modes and for performance data collection. Each circuit element is associated with a parent node, which provides the interface to Access Manager. These nodes may also be configured.

Access Manager maintains a database of the configuration of each node and its associated circuit elements. This database includes the performance data collection (for example, alarm thresholds) and reporting options, the interface to Access Manager options, and the DS1 (for example, line coding, and framing format), DS0, and subrate operating characteristics options. The configuration functions of Access Manager also allow you to define each circuit in the network for performance data analysis and testing (for example, signal output during loopback).

Access Manager allows you to download new architecture to any Access System 2000 circuit element. New architecture may include feature or performance enhancements or changes to a circuit element's basic function.

Status and Performance Monitoring

Access Manager provides local and remote non-disruptive status and performance monitoring of Extended Superframe (ESF) DS1 transmission circuits from a central site (typically a hub office). You can access any circuit element to retrieve current status and performance data. You can also tell Access Manager when to poll the associated far-end circuit elements for performance and status data. Polling allows you to schedule storage of more than 24 hours of data for historical analysis. The performance data can be archived for future reference.

Alarm and System Event Reporting

Access Manager has alarm reporting features which indicate trouble conditions in the circuit elements it is accessing. (For example, a CSU-type circuit element reports an alarm to Access Manager whenever it

loses the incoming signal from the equipment or the network, or if the operator-defined bit error rate threshold in either transmission direction has been exceeded.)

In addition to alarm reports, the performance data and system events can be logged for your review. An example of performance data reports is the Errored Seconds record. System events logged include user log in, log out, and Access Manager system restart.

On-line Access and Testing

Access Manager allows you to access circuit elements and view their current configuration and status. Once an element is accessed, you can also activate and deactivate loopbacks on it for circuit testing and troubleshooting. In addition, some elements can be commanded to send and receive test signals for further assistance in testing and troubleshooting.

Conditions Monitored

The network (NET) and equipment (EQPT) conditions monitored by Access Manager 2000 include:

- On the network side:
  - Bit Error Rate (BER)
  - Errored Seconds (ES)
  - Errored Seconds-Line (ES-L)
  - Unavailable Seconds (UAS) Thresholds Exceeded
  - Loss of Signal (LOS)
  - Payload Loopback (PLB) or Line Loopback (LLB)
- On the equipment side:
  - Loss of Signal/Low Density
  - Equipment Loopback (ELB) or Repeater Loopback (RLB)
  - BER, ES-L, ES, and UAS Thresholds Exceeded

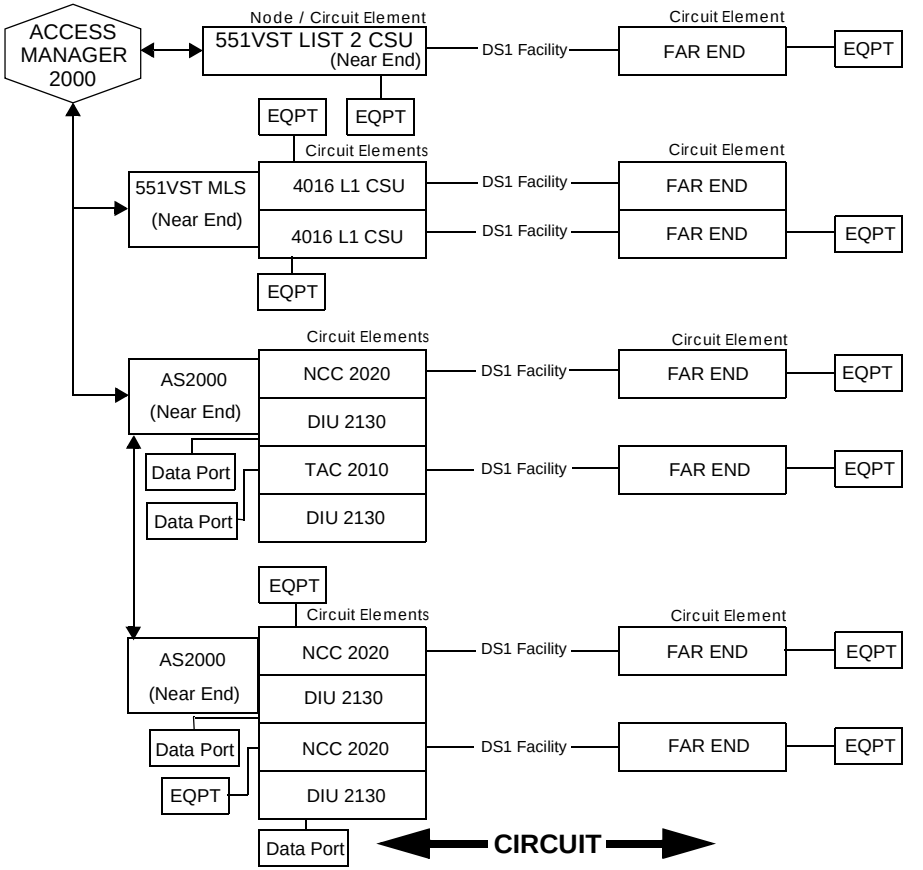
Network Elements

A *network* consists of these *network elements*:

- Nodes
- Circuit Elements
- Circuits
- Routes

Figure 1 -2, "DS1 Network Elements" shows the network elements as they are defined by Access Manager.

Figure 1-2 DS1 Network Elements



A *node* is any equipment that has a single-point Access Manager port (i.e., to which Access Manager can connect in order to access its circuit elements for network management). The single point of access may be in a variety of modes.

The modes of access for near-end nodes are standard implementations of RS-232 interface methods, that is, direct, daisy-chained, through a statistical multiplexer, or by modem. The mode of access for far-end nodes is through the ESF Data Link through the near-end node access. Since the functional specifications of the various Verilink network access systems differ, Access Manager presents a different set of menus for the two different types of nodes.

The two basic types of nodes are:

- **AS2000 type node** (includes Access System 2000 and ConnecT1 Plus network management systems). ConnecT1 Plus is a low-cost implementation of AS2000 hardware available in a dual-line shelf configuration only

  AS2000 and ConnecT1 Plus nodes can have up to four shelves per node. ConnecT1 Plus nodes have only dual-line shelves. AS2000 nodes can have a combination of dual-line and multiline shelves. However, of the four possible shelves in an AS2000 node, no more than two can be multiline shelves.

- **551VST type node** (551VST type single-line nodes; SIM, NC/E, 551VST ML List 1, and 551VST ML List 2 multiline nodes).

This manual presents information mainly through menu descriptions. Access Manager has two types of menus:

- The AS2000 type of menus that reflect the functions of AS2000 and ConnecT1 Plus Nodes.
- 551VST type menus for the other types of nodes.

The various configurations for these nodes are described in the following section.

Single-Line Nodes

The single-line nodes with which Access Manager 2000 interfaces are as follows:

- 551VST List 1/A CSU
- 551VST List 1/B CSU
- 551VST List 2 CSU

Dual-Line Nodes

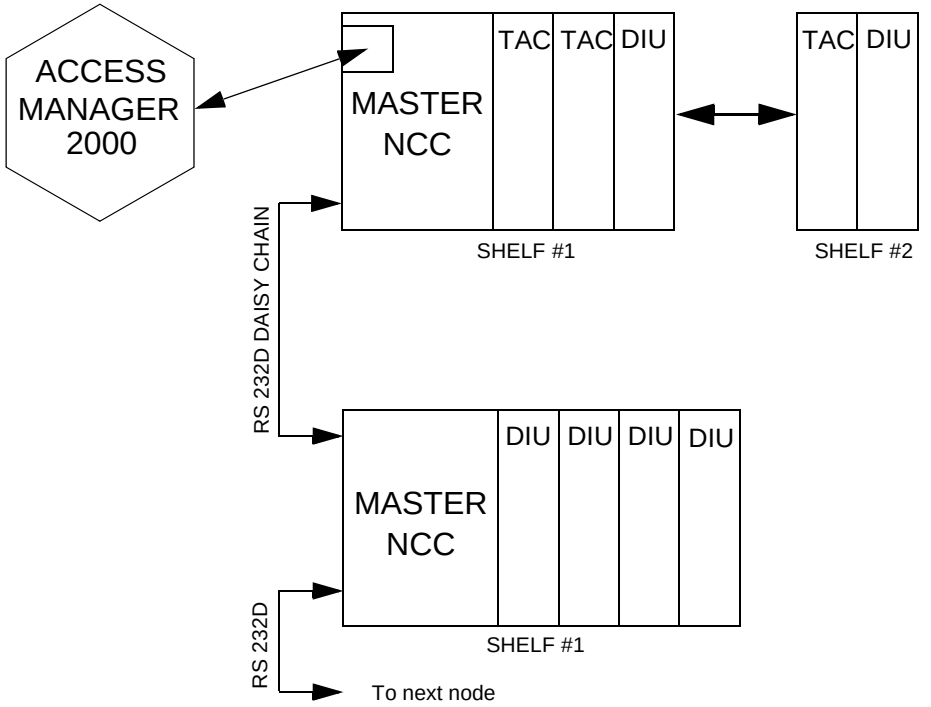
- ConnecT1 Plus: Accesses up to four dual-line shelves containing up to 2 circuit elements (CCC 1020, TAC 1010, DIU 1130, and TIU 1850) per dual-line shelf.
- Access System 2000: Accesses up to four dual-line shelves containing up to 2 circuit elements (NCC 2020,TAC 2010, DIU 2130, and TIU 2850) per dual-line shelf.

Access Manager connects to the master NCC 2020, a plug-in module, which is also a circuit element. The AS2000 is also available in multiline node configurations.

Multiline Nodes

The multiline nodes with which Access Manager interfaces are shown in Figure 1 -3, "Typical AS2000 Multiline Configuration," on pa ge1-7.

Figure 1-3 Typical AS2000 Multiline Configuration



- **SIM:** Accesses one 551VST MLS Shelf containing up to ten circuit elements (4016-R CSUs). Access Manager connects to the SIM (a plug-in module in the shelf).
- **NC/E:** Accesses up to five 551VST MLS Shelves containing up to ten circuit elements (4016-R CSUs) per shelf. Access Manager connects to the NC/E module.
- **551VST ML List 1** Accesses up to two 551VST Multiline Shelves containing up to 14 circuit elements (4016 List 1 and/or List 2 CSUs) per shelf. Access Manager connects to the NMC List 1 module.
- **551VST ML List 2** Accesses up to two 551VST Multiline Shelves containing up to 14 circuit elements (4016 List 1 and/or List 2 CSUs) per shelf. Access Manager connects to the NMC List 2 module.

- **Access System 2000** Accesses up to two multiline shelves containing up to 13 circuit elements per shelf (NCC 2020, TA 2010, DIU 2130, DIU 2140, and TIU 2850). Access Manager connects to the master NCC 2020, a plug-in module which is also a circuit element. Access System 2000 is also available in a dual-line configuration; see previous page under *Dual-Line Nodes*.

Only AS2000 and ConnecT1 Plus nodes can be daisy-chained. The master NCC 2020 or CCC 1020 normally occupies the first slot of the first shelf in each type of node. Refer to the Access System 2000 and ConnecT1 Plus manuals for more information about the shelves, their controller modules, and circuit elements.

Note: *You cannot mix AS2000 hardware and ConnecT1 Plus hardware on the same shelf*

Circuit Element

A *circuit element* is a single module of the parent node to which Access Manager is connected. If the parent node is a single-line module, such as a 551VST List 2 CSU, it has only one circuit element. If the parent node is a multiline module, such as an AS2000 or ConnecT1 Plus, a circuit element is a plug-in module in one of the shelves controlled by the node. This module is identified by the parent node' *Node Name* and a [shelf, slot] index. The types of circuit elements are:

- Single-Line Circuit Elements
- Dual-Line and Multiline Circuit Elements

Single-Line Circuit Elements

The single-line circuit elements with which Access Manager interfaces are as follows:

551VST List 1/A CSU Includes the 551VST List 1 and 551VST List 1/A CSUs.

551VST List 1/B CSU Single-line CSU.

551VST List 2 CSU The Verilink single-line CSU has the same hardware as the 551VST List 1/B. It also has these additional features: automatic alarm reporting, 9600 baud direct connection, and support for the Hayes® modem protocol.

Dual-Line and Multiline Circuit Elements

The multiline circuit element plug-in modules with which Access Manager interfaces are as follows:

4016R	Plug-in CSU module in 551VST MLS shelves.
4016 List 1	Plug-in CSU module in 551VST ML List 1 or 2 shelves.
4016 List 2	Plug-in CSU module in 551VST ML List 1 or 2 shelves.
CCC 1020	Plug-in CSU module in ConnecT1 Plus shelves; it can also function as the node for ConnecT1 Plus shelves.
TAC 1010	Plug-in CSU module in ConnecT1 Plus nodes.
DIU 1130	Plug-in module in ConnecT1 Plus shelves providing high speed data features.
TIU 1850	Plug-in module in ConnecT1 Plus shelves providing timing from external clock for interface between DIUs and CSUs.
NCC 2020	Plug-in CSU module in Access System 2000 shelves; it can also function as the node for AS2000 shelves.
TAC 2010	Plug-in CSU module in Access System 2000 nodes.
DIU 2130	Plug-in module in Access System 2000 shelves, providing high speed data features.
DIU 2132	Plug-in module in Access System 2000 shelves, for Switched Multi-megabit Data Service.
DIU 2140	Plug-in module in Access System 2000 shelves, providing subrate digital data service feature.
TIU 2850	Plug-in module in Access System 2000 shelves, providing timing from external clock for interface between DIUs and CSUs.

Refer to the hardware manuals for more information on these plug-in modules.

Circuit

A *circuit* is the combination of any two network CSU circuit elements and their interconnecting DS1 facility, which have Access Manager access in a DS1 network.

Since all polled performance data is stored in the database by parent node name and circuit element number, the circuit definition contains this path for a circuit element whose performance data is collected through the ESF Data Link.

The circuit definition is also used by Access Manager 2000 during data analysis. This allows you to access the data stored in both circuit elements by the associated circuit name. The circuit definition is also used during the configuration of a far-end CSU through the ESF Data Link.

Route

A *route* consists of the two network circuit elements at DS1 network circuit end points as accessed by Access Manager. For Access Manager, a circuit and a route are functionally equivalent.

Access Manager Connections

Access Manager supports five types of network management ports. These connect Access Manager to the devices it monitors. This information is used in *Chapter 4, Configuring Access Manager* when configuring the Comlines of the host PC.

- **Direct-connect port.** This port can be:
  - Hardwired to the network device.
  - Connected through a pair of full-time (dedicated) modems using a dedicated facility.
  - Connected by a dedicated port into a multiplexer and conveyed in the multiplexer's payload.
- **Remote dial port.** The remote dial port can dial-out and receive dial-in calls from network devices. This port uses the Hayes® AT command set at 1200 or 2400 baud.
- **Remote dial-in port.** This type of port can only answer dial-in calls from network devices (normally used with INWATS lines).
- **Routing port.** The routing port is designed to connect to a routing multiplexer such as a ComDesign RS2000 Statistical Multiplexer. Multiple network devices may be connected through this type of multiplexer.
- **Serial device interface.** This is a serial output-only port with no flow control. Sends alarm messages to a printer or to another computer using the Accumaster protocol.

An optional external Hayes®-compatible modem uses the auto-dial/auto-answer feature to automatically forward changes in the status or alarm conditions of the near-end or far-end CSUs to a central management site.

Appendix B "Modem Configuration" provides the modem configuration information.

Access Levels

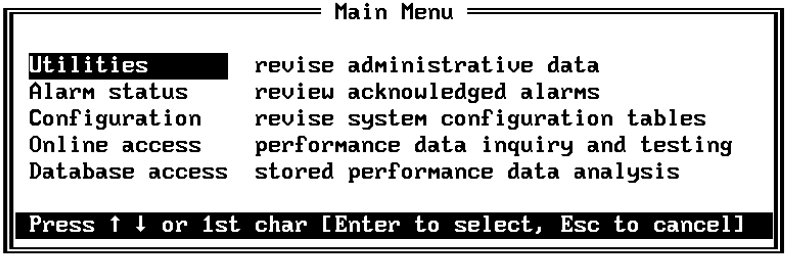
Access Manager provides four levels of user access protection:

- **Level 1:** View data only
- **Level 2:** Includes Level 1 capabilities plus limited non-service-affecting operational changes.
- **Level 3:** Includes Level 1 and 2 capabilities, plus full maintenance control (circuit element loopbacks, testing, etc.).
- **Level 4:** Includes all preceding Level capabilities, plus Access Manager system administration (adding/deleting users, archiving database files, setting passwords, etc.).

Access Manager 2000 Main Menu

Access Manager is divided into five categories of operations. Each of these may be selected from Access Manager's *Main Menu*. This menu appears after you start Access Manager and log in.

Figure 1-4 Access Manager 2000 Main Menu


Main Menu
Utilities revise administrative data
Alarm status review acknowledged alarms
Configuration revise system configuration tables
Online access performance data inquiry and testing
Database access stored performance data analysis
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

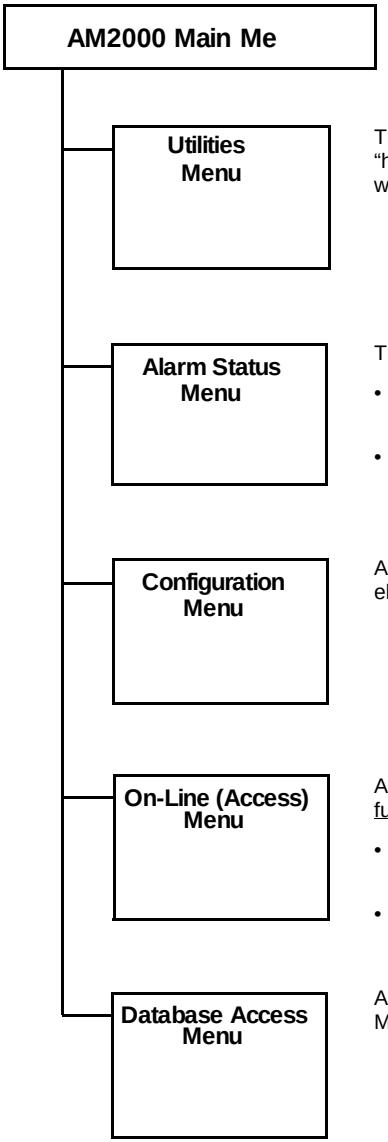
The *Main Menu* provides access to five major menus. The sub-menus list categories of operations you can perform with Access Manager. Each sub-menu also has options, additional sub-menus, and screen displays to assist you in selecting and performing an operation.

Figure 1 -5, "Access Manager 2000 menu tree," on page 1-13, provides an overview of the five major menus. Next to each menu is a short description of its activities.

Following that figure are diagrams of each of the five major menus and their options. These provide you with a quick review of what's in each major menu.

Figure 1-5 Access Manager 2000 menu tree

This diagram provides a view of the major Access Manager 2000 menus. The Main Menu supports five major menus: *Utilities*, *Alarm Status*, *Configuration*, *Online (Access)*, and *Database Access*.



This allows you to configure the Access Manager. Here you set up certain "housekeeping" functions like date and time, what comlines are used, and where you want reports sent and printed.

These commands affect the active alarm counter and the alarm log database.

- An active alarm is an alarm record in the log which has not been manually deactivated by the user and cannot be deleted or archived.
- Alarms that are deactivated can be deleted and/or archived.

Allows you to define or edit the configurations of the nodes, circuit elements, circuits, and routes in the network.

Allows you to access nodes and circuit elements for testing and maintenance functions.

- Through this menu you can acquire the network configuration, status, and DS1 performance data.
- You can also reset the user registers and perform out-of-service testing.

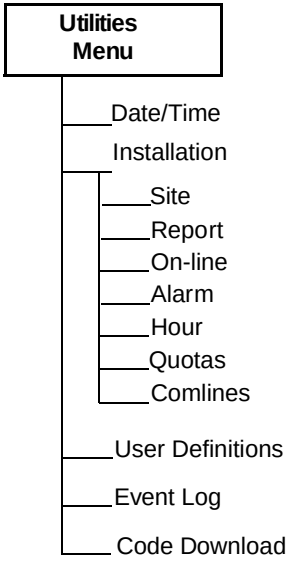
Allows you to process DS1 performance data stored in the Access Manager database.

Not all sub-menus will be accessible at all times. Whether or not a sub-menu is accessible depends on the type of node you are accessing.

Utilities

The **`Utilities`** option of the *Main Menu* allows you to configure the Access Manager system.

It has the following major branches:



Date / Time

This option allows you to set the system date and time.

Installation

This option allows you to define the system site name, define the system printer(s), select the hour to start polling for performance data, allocate database records (for alarms, event logs, and performance data), and define serial communications (COM) ports.

User Definitions

This option allows you to specify user names, passwords, and access levels.

Event Log

This option allows you to view, print, and archive system events such as user log in, user log out, time of scheduled data polling, Access Manager start-up, shut-down, etc.

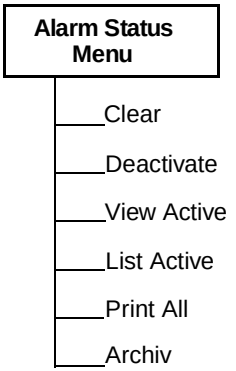
Code Download

This option allows you to download new firmware code in order to update the element firmware or to provide custom applications to a circuit element (NCC 2020, TAC 2010, DIU 2130, or DIU 2140). Only Verilink Access System 2000 modules have this Advanced Programmable Architecture (APA) feature. APA is not available for anyother Verilink single-line or multiline systems.

Alarm Status

The *Alarm Status Menu* commands affect the active alarm counter and the alarm log database. An active alarm is an alarm record in the log that has not been manually deactivated by the user and cannot be deleted or archived. Alarms that are deactivated can be deleted and/or archived.

It has the following major branches:



Clear

This command clears the automatically acknowledged alarms counter.

Deactivate

This command deactivates alarm records and makes them available for deletion and/or archiving.

View Active

This command displays all alarm records that have not yet been deactivated.

List Active

This command prints all alarm records that have not yet been deactivated.

Print All

This command prints all alarm records whether or not they have been deactivated.

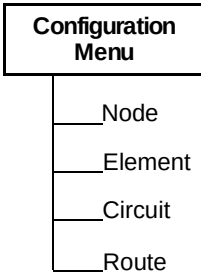
Archive

This command allows you to print, transfer to disk, and/or delete deactivated alarm records.

Configuration

The functions under the *Configuration* menu allow you to define or edit the configurations of the nodes, circuit elements, circuit, and routes in the network.

It has the following major branches:



Node

A *node* is any equipment that has single-point Access Manager access (i.e., to which Access Manager can connect in order to access its circuit elements for network management). The single point of access may be in a variety of modes. The mode of access for far-end nodes is through the ESF Data Link. The mode of access for near-end nodes is either by direct connection or through a statistical multiplexer or modem; additionally, one node controller can access another node controller through a daisy chain.

Circuit Element

A *circuit element* is a single module of the parent node to which Access Manager is connected. If the parent node is a single-line module, such as a 551VST List 2 CSU, it has only one circuit element. If the parent node is a multiline module, such as an AS2000 type, the node may have several elements.

Circuit

A *circuit* consists of any two network circuit elements, and the interconnecting DS1 line, that have Access Manager access in a DS1 network.

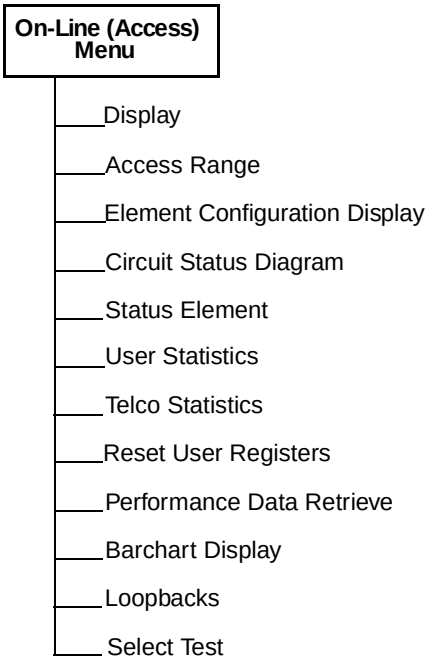
Route

A *route* consists of the two network circuit elements at DS1 network circuit end points as accessed by Access Manager. For Access Manager, a circuit and a route are functionally equivalent.

On-line Access

The *On-line* Menu allows you to access nodes and circuit elements for testing and maintenance functions. Through this menu, you can acquire the configuration, status, and DS1 performance data of the network. You can also reset the user registers and perform out-of-service testing.

It has the following major branches:



Note: *The actual commands listed in the On-line menu depend on which type of CSU or multiline node is accessed. The following commands are typically found in this menu:*

Display

For a multiline node, this command allows you to view the multiline node's hardware configuration, status, controller firmware, and hardware revisions.

Access Range (Access CSU)

This command allows you to select a network circuit element. For multiline CSU nodes, you can access either a single CSU or a range of sequential CSUs. For Access System 2000 nodes, you can access NCCs, TACs, or DIUs.

Element Configuration and Status-Element (Element Status)

These commands show the status, configuration, firmware, and hardware revisions of the CSUs selected by accessing a CSU range. For Access System 2000 nodes, the NCC, TAC, and DIU configuration status may also be viewed.

Circuit Status Diagram

This command allows you to access and graphically display the near-end CSU and associated far-end CSU to which a DS1 circuit is connected.

User Statistics

This command computes and displays the percentages of available and error-free seconds, plus other user performance data for the selected CSU and far-end CSU.

Telco Statistics

This command computes and displays the percentages of available and error-free seconds, plus other Telco performance data for the selected CSU and far-end CSU.

Reset User Registers

This command allows you to reset the user performance registers and error event registers in both the near-end and far-end CSUs.

Performance Data Retrieve

These commands allow you to obtain the 1-hour or 24-hour DS1 performance data stored in a CSU or its associated far-end CSU. You can view either the User data or the Telco data. If the CSU is an AS2000 type, then EQPT data (as well as extra network registers) are available.

Barchart Display

This menu option displays performance data in bar chart format for the current 24-hour period. Bar chart displays for historic performance data are available through Database Access.

Loopbacks

This command allows you to activate or deactivate a loopback at the near-end or far-end CSU, send an inband loop-up or loop-down code to the far-end CSU, or activate or deactivate an ALL-ONEs test signal to the far-end CSU. Loopbacks can help you isolate circuit troubles to either the DS1 network or the CSU at either end. For Access System 2000 and ConnecT1 Plus nodes, the loopback command also lets you activate and deactivate CSU loopbacks with ANSI T1.403-compatible command messages.

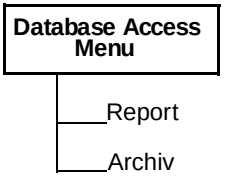
Select Test

This command is available only when interfacing with an Access System 2000 or ConnecT1 Plus node. It allows you to perform diagnostic tests on a circuit connected to the node. You can apply a DS1 test signal from an NCC 2020 or CSU 2010 to the associated circuit for testing. You can similarly apply a test signal to EQPT (i.e., data port) channels of a DIU 2130 or DIU 2140 for path verification.

Database Access

The functions under the *Database Access* menu allow the processing of DS1 performance data stored in the Access Manager database.

It has the following major branches:



Report

This command analyzes and reports on the performance data stored for selected network elements over a selected date and time range through the use of standard filters or user-selected thresholds.

Archive

This command allows you to print performance data records, export them to a spreadsheet or database system, or delete them.

Chapter

2

Installing Access Manager

This chapter provides instructions for installing Access Manager. It also describes the host personal computer and peripheral equipment requirements for Access Manager operation.

Equipment Installation

Before installing Access Manager, verify that your system meets the requirements listed below. These basic system requirements have been tested and are known to be compatible with Access Manager.

Minimum System Requirements

These are the minimum system requirements for Access Manager.

Parameter	Requirements	Recommendations and Notes
Host computer model	AM2000 may be installed on one of the following: • IBM PS/2 Model 80 • AT&T 6386/SX WGS • 100%-compatible 386 PC	Use a color monitor with the appropriate graphics adapter. A VGA monitor is recommended.
Operating system	DOS version 5.0 or later on the host PC. DOS must be fully and properly installed.	
RAM	**Host:** 640K of base memory **Accumaster:** 192K **Total:** 4 megabytes minimum	To use expanded or extended on-board memory, see your application engineer for the specifications on configuring your system.
Hard disk memory	Use a minimum 80-megabyte hard disk with fast access (less than 20 milliseconds).	Program and overhead files take 2 megabytes. The rest is for data storage.
Recommended software drivers	• himem.sys • smartdrv.exe	These are very strongly recommended.

Parameter	Requirements	Recommendations and Notes
Communication ports	• 2 serial ports (if a dial-up interface is being used) and 1 printer port	Also compatible: • DigiBoard DigiCHANNEL MC/8 (PS/2 Model 80 compatible) serial communications board (with 8 serial ports)
Modems	• Hayes® 1200, 2400, or 9600 baud (external • AT&T 2224 (2400 baud external	• An internal Hayes® modem works only if it is configured to use communications Port 1 (COM1) o COM2. • If Access Manager uses more than two ports, using an internal modem is not recommended.
Printer		Epson LQ-1050 (132-column) printer
Statistical Multiplexer		The ComDesign RS2000 or SPX series Statistical Multiplexer, operating at up to 9600 baud, can b added to an Access Manage network as a routing multiplexer to concentrate the communication lines between Access Manager and connected CSUs.
X.25PAD		Tested with NET TX7000 PAD.
Management software	pcANYWHERE III can be used with Access Manager to enable start-up and/or control of Access Manager from a remote terminal.	Do not use newer versions of pcANYWHERE.
Remote terminal	• DEC VT100, o • VT100 emulator	The remote terminal supported by Access Manager through pcANYWHERE software. This is used for remote network management applications, including running Access Manager remotely from an Accumaster site.

Hard disk storage considerations

The maximum available hard disk space is dependent on the size of your hard drive and what version of DOS your PC is running. Up to a maximum of 30 megabytes hard disk space can be available for Access Manager data collection when using DOS 3.3. Newer versions of DOS (for example, DOS 5.0) will allow for proportional storage space depending on the size of the hard disk.

Note: *Verilink recommends that a 80-megabyte hard drive be used when running Access Manager.*

Each alarm record uses 62 bytes of memory, each data record uses up to a maximum of 150 bytes of memory, and each event record uses 58 bytes of memory. As the number of records allocated for a particular type are filled up, the oldest records are deleted to make room for the new records.

The space used on the hard disk for data records, alarm records, or event log records can be freed by using the **`Archive`** option. This option allows you to store records to diskette and/or delete the records entirely. Each of these three types of records (data, alarm, event log) has associated .DAT and .KEY files. To decrease a record's associated .DAT and .KEY files to minimum size and thereby release disk space, all records of a type (for example, all alarm records) must be deleted from the database.

To minimize the space used for data collection, the program stores only records that are non-ZERO.

Software Installation

This section provides instructions for installing Access Manager 2000 software on your host PC's hard disk.

The Access Manager software is provided on two diskette sets:

- a 3.5-inch (720 kilobyte density) diskette set, and
- a 5.25-inch (1.2 Mb density) diskette set

Both diskette sets have identical content. The **`INSTALL.EXE`** program file is on *Diskette # 1* of either disk set. Use the one which fits your floppy drive.

When you install Access Manager 2000, the following files are copied to your hard disk.

Table 2-1 Access Manager Installation Files

ACTIVE.KEY	ALARMLOG.DAT	ALARMLOG.KEY	ALRMDESC.DAT
ALRMDESC.KEY	AM2000.EXE	AM2000.OVL	AM2000.SIG
BUS.KEY	CETABLE.DAT	CETABLE.KEY	CFROM.KEY
CIRCUIT.KEY	CNFSTAT.DAT	CNFSTAT.KEY	COLORATT.DAT
COMLINE.DAT	COMLINE.KEY	CONFIG.SYS	CTO.KEY
DATALOG.DAT	DATALOG.KEY	DBVERS.DAT	DTEVLOG.DAT
DTEVLOG.KEY	EQUIPMNT.DAT	EQUIPMNT.KEY	LEVEL.DAT
LEVEL.KEY	LOCATION.KEY	MONOATT.DAT	NETVLOG.DAT
NETVLOG.KEY	NODE.DAT	NODE.KEY	NODEID.KEY
POINT.DAT	POINT.KEY	PORT.DAT	PORT.KEY
PRENNAME.KEY	RANDC.DAT	RANGE.DAT	RANGE.KEY
README.DOC	RFROM.KEY	ROUTE.KEY	RTO.KEY
SCNAME.KEY	SDDNAME.KEY	SDNAME.KEY	SELECTED.DAT
SELECTED.KEY	SIGCSU.DAT	SIGDDSU.DAT	SIGDSU.DAT
SITE.DAT	SITE.KEY	SSUPARM.DAT	SSUPARM.KEY
TYPE.KEY	UNCLRALM.DAT	UNCLRALM.KEY	USER.DAT
USER.KEY	USERLOG.DAT	USERLOG.KEY	VERINET.DBD

Two working files are generated during Access Manager operation. The files function as transaction files for various program functions and to allow restoration of the database in case of power loss or a computer reset. They are:

VISTA.TAF	VISTA.LOG	

Note: *Refer to the* **`README.DOC`** *file on Access Manager Diskette # 1 for last-minute information and any restrictions placed on the Access Manager revision being installed.*

Installing a new Access Manager system

Use the following procedure if you are installing Access Manager for the first time and if you have never installed Access Manager on your host PC.

To install a new Access Manager system:

1. Insert *Diskette # 1* into drive `A:` (or another floppy diskette drive).
2. To access that drive, type `A:` (or the other disk drive name) and press Enter.
3. At the `A:` prompt, type `INSTALL` and press Enter. The `INSTALL` program's main menu then appears.
4. Select the **`Database Stats`** option, and verify that you have at least two megabytes of space available on the hard disk.
5. After verifying disk space, the `INSTALL` program's main menu reappears. Select the **`Install`** option.
6. Respond to the subsequent prompts to complete the installation of Access Manager in the `AM2000` directory.
7. Before starting Access Manager, you must verify the location and content of your **`CONFIG.SYS`** file.

Verifying the CONFIG.SYS file

For Access Manager to run, you must have a **`CONFIG.SYS`** file which satisfies two requirements. It must:

- reside in the root directory of your hard disk's boot drive (normally drive C), and
- contain the following lines:

`FILES=24`	This command line sets the maximum number of files that can be open at one time. The minimum number required for Access Manager is 24, but the number can be larger, if required by other programs.
`BUFFERS=20`	This command line sets the number of disk buffers DOS allocates in memory when it starts. The minimum number required by Access Manager is 20, but this number can be greater if needed by other programs.

If a **`CONFIG.SYS`** file did not exist in the install drive directory, then the one from the database disk was copied to it. However, if the install drive (for example, drive `D:`) is not the same as the boot drive (normally, drive `C:`), you'll need to determine whether or not the boot drive has an appropriate **`CONFIG.SYS`** file.

The following instructions assume that your host PC boots from the C: drive. If the boot drive letter is other than "C", use that letter in place of "C" in the steps below.

To determine whether the boot drive has an appropriate `CONFIG.SYS` file:

1. At the DOS **`C:\>`** prompt, type `CD\` and press Enter.
2. At the **`C:\>`** prompt, type `CONFIG.SYS` and press Enter.
   a. If DOS returns the error message `FILE NOT FOUND`, a **`CONFIG.SYS`** file does not exist in your system.

      Then, you must follow the instructions for copying the **`CONFIG.SYS`** file to the root directory of the boot drive.

   b. If a **`CONFIG.SYS`** file exists, it will open. Verify that the `FILES` and `BUFFERS` lines exist in **`CONFIG.SYS`**. Verify that the number of files and buffers called by these lines is sufficient. If the lines don't exist or the number to the right of the equal (=) sign is too small, you must follow the directions for modifying the **`CONFIG.SYS`** file.

To copy the CONFIG.SYS file to the root directory of the boot drive:

1. Type `C:` and press Enter to return to the boot drive.
2. Type `CD\` and press Enter to return to the root directory on the boot drive.
3. Insert *Diskette #1* of Access Manager 2000 into drive A.
4. At the boot drive prompt, type `COPY A: CONFIG.SYS` and press Enter.

   The **`CONFIG.SYS`** file is created in the root directory.
5. Remove the diskette from drive A.

Note: *The new values for FILES and BUFFERS are not in effect until the host PC is rebooted and DOS is restarted.*

6. Reboot your system to activate the new values before starting Access Manager. Otherwise, you will not be able to log into Access Manager.

To modify an existing CONFIG.SYS file:

The existing **`CONFIG.SYS`** file must be modified if it does not contain FILES=24 (or greater) and BUFFERS = 20 (or greater).

1. Modify the **`CONFIG.SYS`** file with EDLIN (the text editor for DOS) or with any text editor or word processor with an ASCII text editor option.
2. Reboot the system after you change the **`CONFIG.SYS`** file. The values for `FILES` and `BUFFERS` are not in effect until you do.

Updating an existing Access Manager system

Use the following procedure if Access Manager is installed on your host PC and you want to upgrade to the current version.

To update an existing Access Manager system:

1. If the current Access Manager directory is named `AM2000`, create a backup directory named, for instance, `AM2000.BAK`.

2. Copy the current directory's contents to `AM2000.BAK` so that the current directory can be used by the update.

3. Insert *Diskette # 1* into drive A: (or another floppy diskette drive).

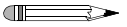
4. To access that drive, type `A:` (or the other diskette drive name) and press Enter.

5. At the `A:` prompt, type `INSTALL` and press Enter. The INSTALL program's main menu should appear

6. Select the **`Database Stats`** option to determine if the host PC has enough space to hold the new software and modified database.

   You need approximately 2 megabytes of hard disk space for the software files, plus space equal to the size of your Access Manager database. To calculate the size of the Access Manager database, add together all files which have the extensions `.DAT` and `.DBD`.

   For example, if you are updating an Access Manager installation with an 8-megabyte database, you need 2 + 8 = 10 megabytes of space on your hard disk.



The **`Database Stats`** *selection can be used at any time to determine database size and available hard disk space.*

7. You need to decide how you want the database to be affected.

   - To convert the existing database to the latest Access Manager format, select the **`Full Update`** option. This is the recommended method.
   - To leave the existing database in its current format, select the **`Partial Update`** option. This should only be used for interim releases.

8. After choosing one of the above, respond to the subsequent prompts to complete the selected action.

9. When the program prompts you for the new Access Manager directory to be created, type `AM2000`.

The INSTALL program then copies the Access Manager program files and all blank database files into the newly created directory. It transfers all data from the current database to the new database and leaves the current database intact.

10. Now the installation is complete, and you need to update a few other files:

    If pcANYWHERE is being used:

    a. Copy the pcANYWHERE files from the old Access Manager directory into the `AM2000` directory.

    b. If changes have been made to the factory default settings, either copy the `.CFG` file from the `AM2000.BAK` directory to the `AM2000` directory or reconfigure pcANYWHERE from the start.

    If you made changes to the `COLORATT.DAT` and `MONOATT.DAT` files:

    a. You must make the same changes to the new `COLORATT.DAT` or `MONOATT.DAT` files in the `AM2000` directory.

    b. This can be done with a standard ASCII text editor.

11. After the update is completed, go to the `AM2000` directory and start Access Manager.

12. When you're sure that the new database is working properly, delete the old database in the `AM2000.BAK` directory you created in Step 1.

Creating a batch file for automatic start-up

By using a start-up batch file, you can set up Access Manager to do one of the following:

- start up automatically when your system boots up, or
- start from any directory.

For automatic start-up whenever the host PC is powered up, you can modify an existing **`AUTOEXEC.BAT`** file in the DOS root directory.

For manual start-up from any director , you can create a file called **`AM2000.BAT`** (or anything else you like) in any directory which exists in the DOS path. Once this file has been created and saved, you can type

AM2000 in any directory to start the program. The batch file automatically changes to the Access Manager directory and starts the Access Manager program.

In either case, you must use statements from Table 2-2, “Batch file commands for automatic start-up,” on pag e2-10. All editing can be done with an ASCII text editor, such as EDLIN.

Add the following lines to your batch file as required:

Table 2-2 Batch file commands for automatic start-up

Command line	Function
CD drive:\AM2000	To change to the directory where Access Manage is installed. If the directory is other than AM2000, use that directory‘s name in lieu of AM2000. For “drive”, use your appropriate drive letter.
ANYWHERE AUTOMATIC	To start up the pcANYWHERE III program.
AM2000	To use a color PC.
AM2000/BW	To use a monochrome monitor with a color PC or monochrome PC.
AM2000/VT	To start Access manager in the VT100 mode; required if pcANYWHERE is used. The **/VT** command causes Access Manager to run its VT100 screens. This means that function and other key combinations are shown on the screen as the required key strokes used on a VT100 terminal.
AM2000/VT/BW	To start Access Manager in the VT100 mode on a monochrome PC; required if pcANYWHERE is used. The **/BW** command causes Access Manager to run in black-and-white mode. If a remote computer is being used with: • a VT100 terminal emulation progra , then the terminal emulation program capabilities determine whether or not the /BW command is required. • an actual VT100 terminal, then Access Manager can be used in color mode by leaving off the /BW command.
TZ = xSTn	This is used to set the clock only if an Accumaster interface is being used. See“Time Zone Setup for Accumaster” on page2-14 for values of x and n.

After making any changes to your start-up batch file, save the file and reboot your system.

Limitations

- **ProComm** can operate in the color mode if the remote PC has a color graphics card and monitor.
- Due to the use of certain escape key combinations, **Crosstalk XVI** cannot be used.
- If Access Manager is to be used from a remote VT100 terminal most of the time, the **`AUTOEXEC.BAT`** file should first start up pcANYWHERE and then start in VT100 mode.
- If Accumaster is being used, the line `SET = xSTn` must precede any command that automatically starts Access Manager in the **`AUTOEXEC.BAT`** file.

Setting up the remote terminal

This section describes how to set up a remote terminal and keyboard. This requires the installation of pcANYWHERE III.[1]

pcANYWHERE is a remote access software program available from Dynamic Microprocessor Associates. It lets you operate an IBM PC, XT, AT, PS/2, or 100% IBM-compatible from a DEC VT1000 or VT1000 emulator at a remote location. The remote PC or terminal operates as the monitor and keyboard for the local system.

You must install pcANYWHERE if Access Manager will be run with Accumaster. pcANYWHERE permits the Accumaster operator to access and control Access Manager from the Accumaster console.

Proper operation of pcANYWHERE requires the following:

- a host PC with a minimum 192K of system RAM (45K of RAM is used when pcANYWHERE is left resident.)
- a host modem
- a remote modem, and
- a remote terminal (or a PC running terminal-emulator software) to control the host PC.

1. All references to pcANYWHERE III throughout this document are generically called “pcANYWHERE”.

For detailed information on the installation or operation of pcANYWHERE, refer to the manual supplied with it. Additional default setting information regarding use with Access Manager is given in this section.

To install pcANYWHERE in a host PC:

1. Install pcANYWHERE onto the host PC hard disk into the same directory where Access Manager was installed. Typically, this directory is named `AM2000`.

2. Copy pcANYWHERE files from the program diskettes into that directory, as explained in the pcANYWHERE user's manual.

The following pcANYWHERE III parameters settings should be used when configuring the host PC:

pcANYWHERE Parameter	Setting
Baud rate	The baud rate setting depends on the modem type in use. This setting can range from 50 to 57600 baud, or it can be set to Auto-baud. Access Manager works at 1200 and 9600 bau with a modem or, if direct connect, up to 19200 baud. The DEC VT100 default setting is 300 baud.
Com Port	Alway COM
Connect type	There are 3 connection options: `Direct Connect`, `Automatic Modem`, or `Manual Modem`, with the following limitations. • For `Direct Connect`, do not use any "log in"; that is, set the log in parameters to `Defaults`. Also set the inactivity time-out to `0`. • For a `Manual Modem` connection, use "log in".
Co-pilot mode	Either system keyboard may be made active. The normal setting should be `Both Keyboards Active`.

pcANYWHERE Parameter	Setting
Inactivity time-out	Set to `No Time-out` or `0 seconds`, to allow pcANYWHERE to hang up only if the remote modem hangs up. The inactivity time-out does not work unless it is set to less than one minute. This is because in the remote terminal (/VT) mode Access Manager updates the screen (current time once every minute and pcANYWHERE treats this as activity. The remote operator is responsible for dropping the line when communications is complete.
Login parameters	This option allows you to set the login parameters (such as the password). Selecting the **`Defaults`** option applies the same login parameters to every remote caller.
Terminal Type	This allows pcANYWHERE to know whether you are using a remote PC or remote terminal to run the Host PC. Select `VT100`.

Remote Access Port

Access Manager 2000 requires that the host PC has one dedicated communications serial port for access by a remote terminal or computer. COM1 is normally assigned as the dedicated pcANYWHERE port. This is the remote access port and is configured in the *Host PC* setup of pcANYWHERE. COM2 and upward are then configured within Access Manager.

CAUTION

The default configuration of Access Manager includes COM1 as a Comline Definition. It must be deleted from the database wheneve using COM1 as the remote access port with pcANYWHERE. When a modem is used with the remote access port, and pcANYWHERE is configured for a modem, then pcANYWHERE automatically configures the modem.

Setting up Accumaster

Accumaster is anAT&T network management system which can manage alarm messages from Access Manager. When used together, Access Manager sends alarms through a comport in an Accumaster protocol.

Setting this up requires the following:

- Physical connections between the host PC and xxx.
- Your host PC must be running pcANYWHERE.
- You must be using the largest (-1000) Access Manager package.
- You must use the Access Manager menus to set up a utility.
- Your **AUTOEXEC.BAT** file must include the time zone variable, TZ = *x*ST*n*. This must always accurately reflect the appropriate standard time or daylight savings time.

Time Zone Setup for Accumaster

Since the alarms sent to Accumaster must be time-stamped and include time zone, an environment variable (TZ) must be set up in your **AUTOEXEC.BAT** file.

The following line should be added to the **AUTOEXEC.BAT** file prior to any batch command that automatically starts Access Manager.

```
SET = xSTn
```

where *x* and *n* are filled in from Figur e2-3, Accumaster Time Zone Chart". For example, EST5 would be used in the Eastern Time Zone when daylight savings time is not in effect.

Table 2-3 Accumaster Time Zone Chart

Time Zone	Standard Time	When/If Daylight Saving Time is in Effect
Hawaii	HST10	HST9
Alaska	LST9	LST8
Pacific	PST8	PST7
Mountain	MST7	MST6
Central	CST6	CST5
Eastern	EST5	EST4
Atlantic	AST4	AST3

The time zone string (for example, PST) is not critical, as long as it is three characters long. The number following the string is critical because it represents the number of hours difference from Greenwich Mean Time (GMT), which must be included in all alarm records sent to Accumaster.

Before Starting Accumaster

Before Accumaster is run for the first time, the network should be configured. In particular, the Alarm output is configured (within Access Manager) the same as configuring an Alarm Printer. Since only one alarm output can be defined, the configuration of alarms being sent to Accumaster precludes the use of a physical alarm printer. The communications port to be used is configured as a Serial Device. If a modem is used, it must be set to *Auto Answer*, as described in AppendixB, "Modem Configuration".

Chapter

3

Using Access Manager

This section provides you with information about:

- screen appearance and content
- using the keyboard and keystrokes
- navigating between screens

Basics

This section discusses the basics of moving around in the Access Manager screens.

Basic Display

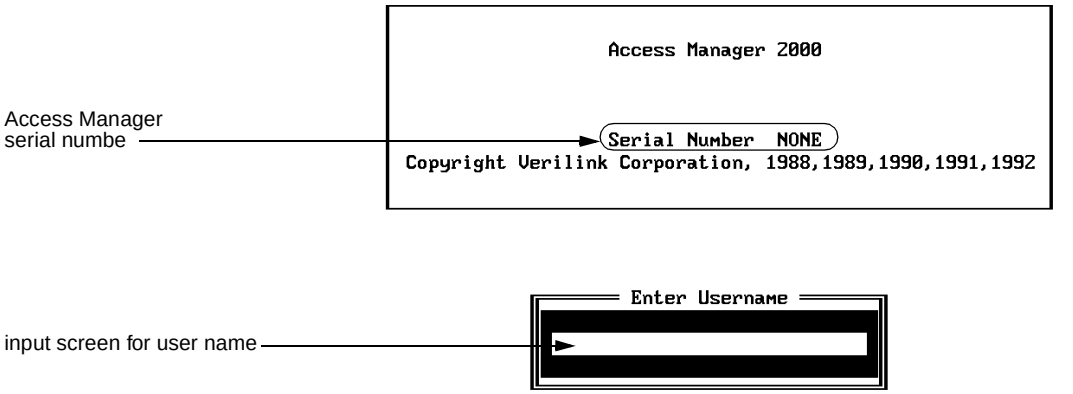
Using a color monitor

If you are in a *View* screen, or if the present access level prevents you from making changes to a particular part of the database, the entries and options appear in red. If you are in an *Edit* or *Add* screen and the access level allows you to change an entry or option, the entries are displayed in white on blue at the cursor position, and in blue on white for all other positions.

Screens

When you first log into Access Manager, you're presented with a *Username* screen, shown in Figure 3-1, "Username Screen," on pag e3-2.

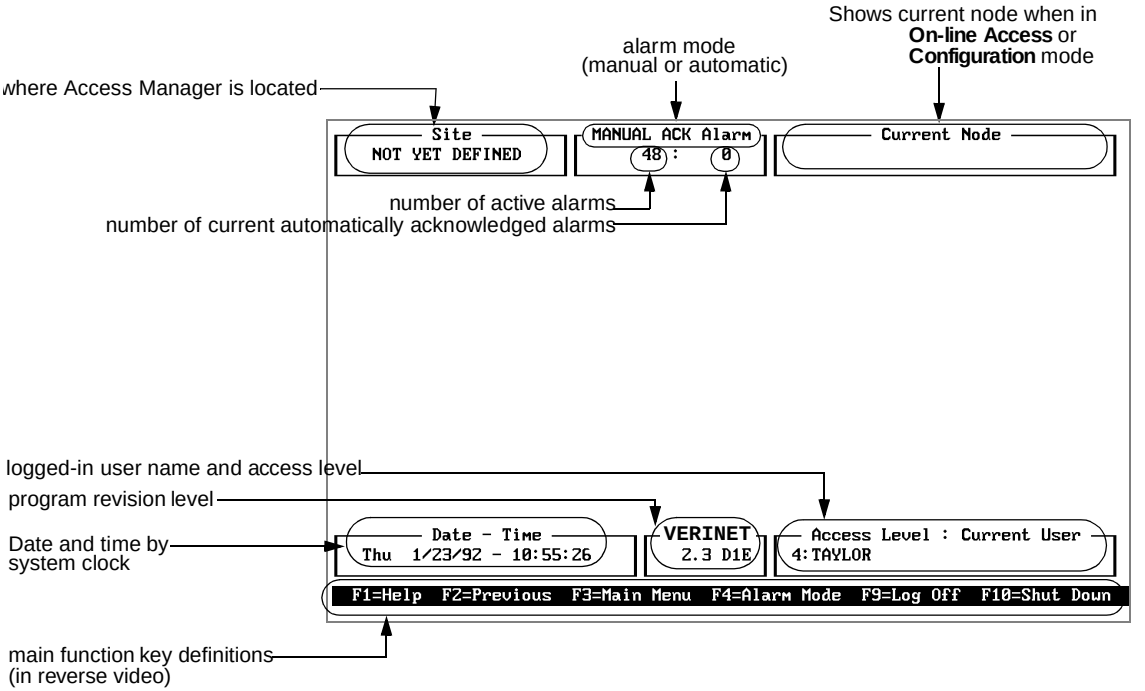
Figure 3-1 Username Screen



In this screen, you enter your username and, susequently, your password. This logs you on to Access Manager 2000.

Once you've logged on, the *Main Menu* will appear. That screen, and all other Access Manager 2000 screens, are framed within the boundaries of the screen shown in Figure 3-2, "Basic display on host PC," on page 3-3.

Figure 3-2 Basic display on host PC

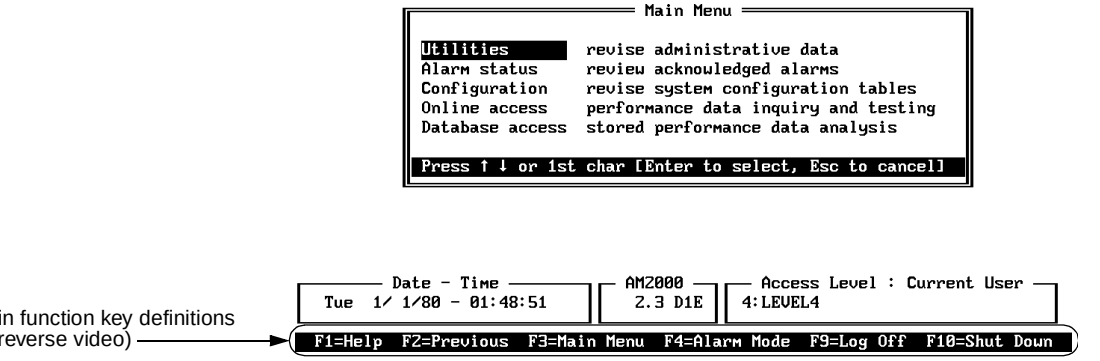


Differences in displays when in VT100 mode

The personal computer and VT100 display the same information on their respective screens, with the following exceptions:

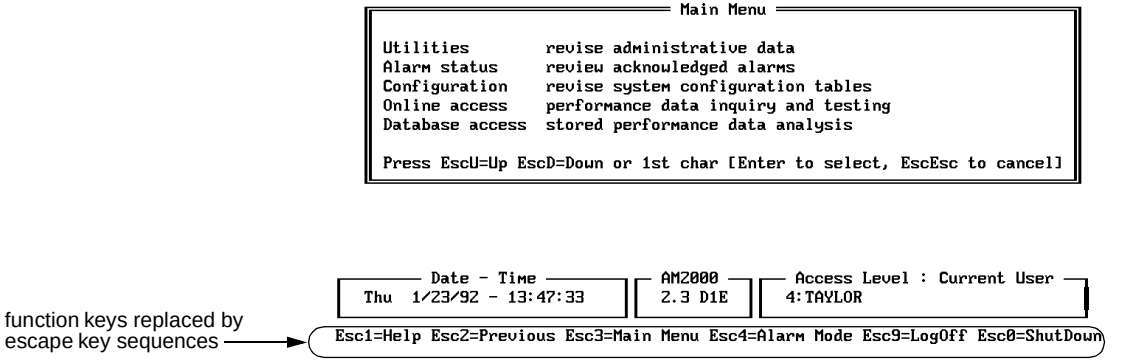
- Operating Access Manager locally on the personal computer results in the display showing all commands as function keys (F1 to F10). This is shown in Figure 3 -3, "Function key display at host PC," on page 3-4.

Figure 3-3 Function key display at host PC


Main Menu
Utilities revise administrative data
Alarm status revieu acknouledged alarms
Configuration revise system configuration tables
Online access performance data inquiry and testing
Database access stored performance data analysis
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]
Date - Time
Tue 1/ 1/80 - 01:48:51
AM2000
2.3 D1E
Access Level : Current User
4:LEVEL4
Main function key definitions (in reverse video)
F1=Help F2=Previous F3=Main Menu F4=Alarm Mode F9=Log Off F10=Shut Down

- When operating Access Manager remotely with a VT100, the display shows the commands as escape key combinations. If using a personal computer keyboard, the function keys may still be used. This is shown in Figure 3 -4, "Escape key sequence display at VT100 terminal".

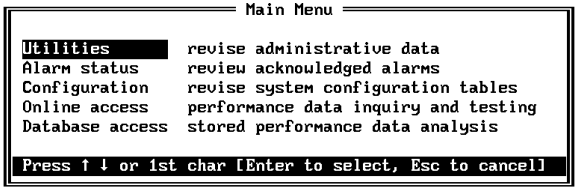
Figure 3-4 Escape key sequence display at VT100 termina


Main Menu
Utilities revise administrative data
Alarm status revieu acknouledged alarms
Configuration revise system configuration tables
Online access performance data inquiry and testing
Database access stored performance data analysis
Press EscU=Up EscD=Down or 1st char [Enter to select, EscEsc to cancel]
Date - Time
Thu 1/23/92 - 13:47:33
AM2000
2.3 D1E
Access Level : Current User
4:TAYLOR
function keys replaced by escape key sequences
Esc1=Help Esc2=Previous Esc3=Main Menu Esc4=Alarm Mode Esc9=LogOff Esc0=ShutDown

Menus

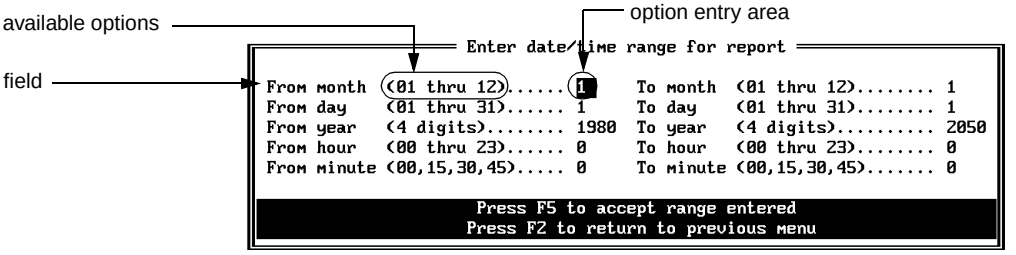
Although we refer to almost all displays as "screens", those screens which allow you to select options are menus. Menus either provide access to another menu or take you to a screen with fields for data entry.

For example, the *Main Menu*, shown below, provides access to five other menus.

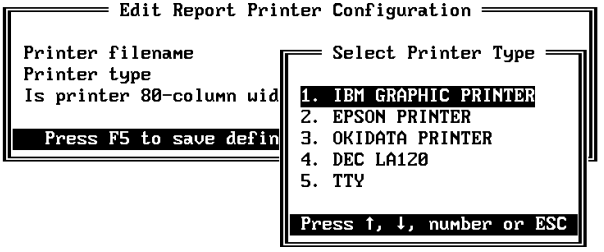

Main Menu
Utilities revise administrative data
Alarm status review acknowledged alarms
Configuration revise system configuration tables
Online access performance data inquiry and testing
Database access stored performance data analysis
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

If you select the **`Utilities`** option, the *Utilities Menu* appears.

Every field which calls for a choice shows the default or chosen option on the right. When the available options are few, the options may be enclosed in parentheses after the field text and before the option area on the right.


available options
option entry area
field
Enter date/time range for report
From month (01 thru 12)..... 1
To month (01 thru 12)..... 1
From day (01 thru 31)..... 1
To day (01 thru 31)..... 1
From year (4 digits)..... 1980
To year (4 digits)..... 2050
From hour (00 thru 23)..... 0
To hour (00 thru 23)..... 0
From minute (00,15,30,45)..... 0
To minute (00,15,30,45)..... 0
Press F5 to accept range entered
Press F2 to return to previous menu

When multiple options are available for a field, the field's text will usually be followed by an (F8) or instructions at the bottom of the screen will tell you to use (F8) to display options. When you press (F8), a list of options will appear, superimposed on the current menu.



Status Display

Status screens provide information directly from on-line data. Status screens are “read only” and provide status information only for the moment that you access the screen. The screen does not update itself. To find out that a condition you see on the screen has changed, you would have to exit out of the screen and then reaccess it.

Alarm notifications, however, do let you know immediately if there is a significant change.

Keyboard

This section describes the function keys, cursor movement keys, and special keys used at a PC keyboard.

- ***Function keys*** are used to select and/or activate specific operations in Access Manager.
- ***Cursor movement keys***, also known as directional keys, are used to move between fields and screens.
- ***Special keys*** are used to perform special functions within Access Manager. Sometimes, this involves using keystroke combinations.

Because there are differences between the keyboards, it subsequently describes the equivalent keystrokes used at a VT100 terminal keyboard.

Regardless of the operation mode (PC or VT100), the keyboard directly attached to the Access Manager computer always uses the normal PC function keys.

Function keys

The <F1> through <F10> function keys are used to select and/or activate specific operations in Access Manager.

If you are running pcANYWHERE, the function keys are not available.

Table 3-1 Function key definitions in PC mode

Key	Meaning	Definition
<F1>	**Help**	Pressing F1 displays the on-line help screen for *Function Key Definitions*. It provides help specific to the terminal mode (PC or VT100) you are currently in.
<F2>	**Previous screen**	Pressing F2 returns you to the previous scree from which you selected the current option. It also aborts any data entry you may have made while currently in the *Data Monitor* scre F7 ().
<F3>	**Main menu**	Pressing F3 returns you to the **`Main Menu`** from any point in the program, except when pressed from a screen expecting keyboard responses.
<F4>	**Auto Ack/Manual Ack**	Pressing F4 toggles between the manual an automatic alarm acknowledge modes. In the automatic acknowledge mode, the messag **`AUTO ACK ALARM`** flashes in the top center block. In the monochrome mode, the words are highlighted an do not flash. ***NOTE**: When no user is logged in, the alarm mode is automatic and reverts to the mode selected in the Installation menu as soon as a user logs in.*
<F5>	**Accept update**	Pressing F5 saves changes or additions made to the current element or, in most data entry screens, tells Access Manager to accept the on-screen data.
<F6>	**Approve update of entire range**	Pressing F6 for multiline nodes updates the entir range of circuit elements selected with the options entered in the **`Edit Circuit Element`** option under the *Configuration* Menu.
<F7>	**Data monitor**	Pressing F7 toggles the status of the data monitor: A window appears in the lower left of the screen, showing the number of seconds before scheduled dat collection and polling begins. During scheduled data collection, the right side of the screen shows the circuit element from which data is being collected and the left side shows the data monitor status.
<F8>	**Display a list of options**	Pressing F8 displays a sub-menu of the selections available for one of the option-fields in the current menu. If the F8 function is available, it is indicated at the bottom of the menu or in the option-field line.

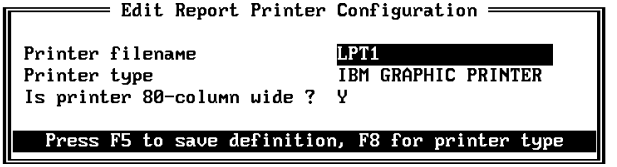
Key	Meaning	Definition
<F9>	**Log off**	Pressing (F9) logs you off Access Manager without shutting it down.
<F10>	**Shut down**	Pressing (F10) exits you from Access Manager to DOS. You must have a LEVEL4 access to do this. After pressing (F10), a message appears that asks you whether or not to shut Access Manager down. Typing **Y** continues the shut-down.

When Access Manager is started in VT100 mode, the bottom of the screen displays escape key sequences instead of function keys. However, if you are using the PC keyboard (rather than a terminal keyboard), the function keys must still be used.

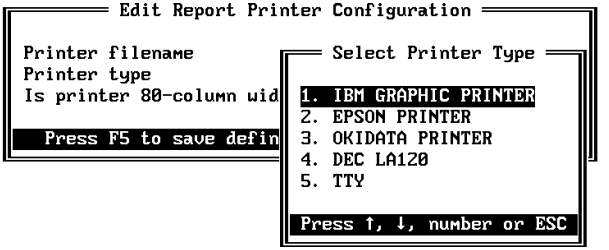
Example:

Using the (F8) function key:

You are in the **`Printer filename`** field, and you'd like to know what other printer options are available.


Edit Report Printer Configuration
Printer filename LPT1
Printer type IBM GRAPHIC PRINTER
Is printer 80-column wide ? Y
Press F5 to save definition, F8 for printer type

To find out what other printer options are available, press (F8). A screen containing a list of options appears, superimposed, over the first screen.



Cursor movement keys

The following keys are also referred to as directional keys throughout the Access Manager manual. They are used to move between fields, entries, and screens.

A listing of these definitions is provided in Table 3-2, “Cursor movement key definitions in PC mode,” on page 3 -9.

Table 3-2 Cursor movement key definitions in PC mode

Key	Meaning	Definition
<Up Arrow> and **<Down Arrow>**		These keys move the cursor up or down to position the cursor at an entry (or item) from a list on the screen. • If a list extends beyond the top or bottom of the current screen, the screen scrolls in the direction of the pressed arrow key. • On single-screen displays, the cursor wraps around to the opposite end of the screen.
<Left Arrow> and **<Right Arrow>**		These keys move the cursor to the left or right on a data entry line.
<PgDn>:	Next Page	If more than one screen of information exists for the current screen, pressing PgDn displays the next screen (page) of information below the current cursor position.
<PgUp>	Previou Page	If an additional screen of information exists above the current screen (page), pressing PgUp ys the next screen of information above the current cursor position.
<Home>		Pressing Home moves the cursor to the beginning of a list. This includes lists which have more items than can be displayed in a single screen.
<End>		Pressing End moves the cursor to the end of a list. This includes lists which have more items than can be displayed in a single screen.

Special keys

The keys described in this section are used to perform special functions within Access Manager.

A listing of these definitions is provided in Table 3-3, “Special key definitions in PC mode,” on page 3 -10.

Table 3-3 Special key definitions in PC mode

Key		
<ENTER>		Pressing the Enter key either selects the option highlighted by the current cursor position from a menu screen, or accepts the value of data entered into a selected field. If less than the maximum number of characters are entered in a field, press Enter complete the entry for that line and move the highlight to the next line.
The following four choices require the Ctrl key to be pressed and held while pressing the second key. The Ctrl key is displayed on the *Function Key Definition* screen and many othe screens as (^).		
<Ctrl>-<PgDn>	Next Element	Press the Ctrl PgDn key combination to select the next circuit element in a selected range. This key name appears on the screen as <Ctrl>-<PgDn>.
<Ctrl>-<PgUp>	Previou Element	Press the Ctrl PgUp key combination to select the previous circuit element in the selected range. This key name appears on the screen as <Ctrl>-<PgUp>.
<Ctrl>-<Left Arrow>	Near End	Press the Ctrl ← key combination from the On-line screens to select the near-end CSU information. This key name appears on the screen as <Ctrl>-<Right Arrow> Near-end.
<Ctrl>-<Right Arrow>	Far End	Press the Ctrl → key combination from the On-line screens to select the far-end CSU information. This key name appears on the screen as <Ctrl>-<Right Arrow> Far-end.
<ESCAPE>		Press the Esc key to cancel data input requests on an operational basis and to exit an option menu without selecting an option. Also press Esc to immediately abort a connection request or print request.

Key	
<INS>	Press (Ins) a data entry screen to toggle between the text insert mode and the text overwrite (normal) mode. When the insert mode is activated, a block cursor blinks in the input line. In the overwrite mode, a smaller cursor blinks at the bottom of the input line. The insert mode is active for the current line only. If you move the cursor up or down one line with the arrow keys, or if you press (F5) e the screen values, the insert mode goes back to the overwrite mode. When you are in the overwrite mode on any screen, entering any character in the first position of the data entry line deletes all other characters on that line. To change only the first character in a line, press (Ins) change from the overwrite mode to the insert mode. If all character positions allowed for a data entry line are filled, delete the first character with the (Del) key and enter the new first character.
<DEL>	Press (Del) ete the character or space at the current cursor position.
<BACKSPACE>	Press the (Backspace) key to delete the character or space immediately preceding the current cursor position.

Equivalent VT100 Keystroke

With Access Manager operating in the VT mode under pcANYWHERE III, commands entered from the VT100 terminal use different keystroke combinations than the PC keyboard. This occurs because the VT100 terminal, unlike the PC, does not have function keys.

In the VT terminal mode, the screen displays the applicable escape key combinations used with the VT100 terminal.

The PC function keys and their corresponding VT100 escape sequences are listed in Tabl e3-4, “Function key and escape key sequences in VT100 terminal mode,” on page 3 -12. This table also describes the function of each sequence.

To return to the regular operating mode, shut down Access Manager and restart it without the **/VT** command.

Table 3-4 Function key and escape key sequences in VT100 terminal mode

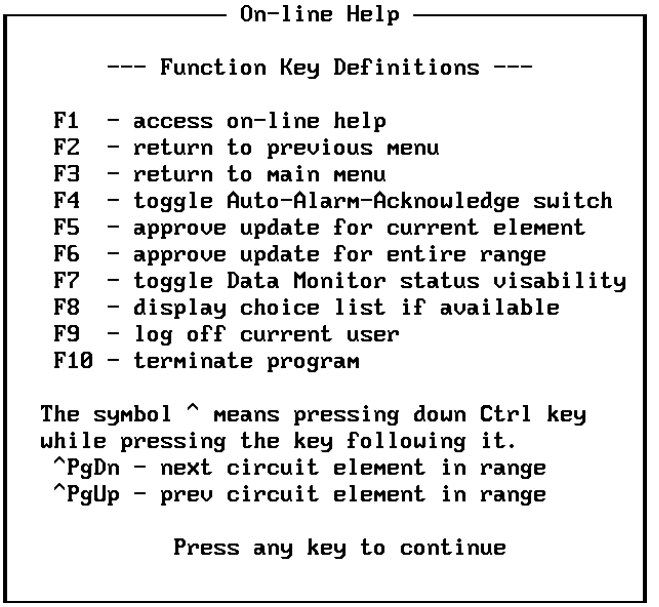
PC mode Function Key	VT100 terminal mode Escape key sequence	Description
<Esc>	<Esc>-<Esc>	Cancel data/Exit request
<Up Arrow>	<Esc>-<U>	Move one line u
<Down Arrow>	<Esc>-<D>	Move one line down
<Left Arrow>	<Esc>-<L>	Move cursor left
<Right Arrow>	<Esc>-<R>	Move cursor right
<Home>	<Esc>-<H>	Move cursor to first line
<End>	<Esc>-<E>	Move cursor to last line
<PgUp>	<Esc>-<P>	Move to previous page
<PgDn>	<Esc>-<N>	Move to next page
<Ctrl>-<Left Arrow>	<Esc>-<C>-<L>	Select Far-End
<Ctrl>-<Right Arrow>	<Esc>-<C>-<R>	Select Near-End
<Ctrl>-<PgUp>	<Esc>-<C>-<P>	Select Previous CSU
<Ctrl>-<PgDn>	<Esc>-<C>-<N>	Select Next CSU
<Ins>	<Ins>	Toggle insert/overwrite
<Del>	<Del>	Delete character/space
<F1>	<Esc>-<1>	Help
<F2>	<Esc>-<2>	Go to previous screen
<F3>	<Esc>-<3>	Return to Main Menu
<F4>	<Esc>-<4>	Toggle between manual and automatic alarm acknowledge modes
<F5>	<Esc>-<5>	Accept updated info to element
<F6>	<Esc>-<6>	Accept updated info to range of element
<F7>	<Esc>-<7>	Toggle status of data monitor
<F8>	<Esc>-<8>	Show a list of options
<F9>	<Esc>-<9>	Log off Access Manager without shutting down
<F10>	<Esc>-<10>	Shut down Access Manager with LEVEL4 access onl .
not available	<Esc>-<C>-<S>	Update *pcANYWHERE* Screen

Help

To get a help screen that provides ***function key definitions***, press F1 .

This displays an on-line help screen labeled **`Function Key Definitions`**. This is shown in Table 3-5, “On-line Help screen (host PC mode)”.

Figure 3-5 On-line Help screen (host PC mode)


On-line Help
--- Function Key Definitions ---
F1 - access on-line help
F2 - return to previous menu
F3 - return to main menu
F4 - toggle Auto-Alarm-Acknowledge switch
F5 - approve update for current element
F6 - approve update for entire range
F7 - toggle Data Monitor status visability
F8 - display choice list if available
F9 - log off current user
F10 - terminate program
The symbol ^ means pressing down Ctrl key
while pressing the key following it.
^PgDn - next circuit element in range
^PgUp - prev circuit element in range
Press any key to continue

The screen will be appropriate for the terminal mode (PC or VT100) you are currently in.

If you need technical help, refer to this manual orcall Verilink Technical Support at 1-408-945-1199.

Error Messages

If you enter an unacceptable value in a data entry screen, an error message will appear in the middle of your screen. If you’re using a color monitor, the error message will be white text in a red box. The word “ERROR” will appear at the top. This is followed by information which tells you which field and option is causing the error. It may point out the appropriate range of values or necessary corrective action.

Warning Messages

If you're using a color monitor, the warning message will be white text in a red box. The word "WARNING" will appear at the top.

You will receive a warning message when you're about to perform an operation which may cause a line to become out of service or database information to be overwritten.

Warning messages always offer you a choice. They allow you to choose whether you want to continue the operation or take the often wiser course of backing out.

Alarm Messages

If you're using a color monitor, the warning message will be white text in a red box. The word "ALARM" will appear at the top.

Alarm messages provide information about the state of either Verilink equipment or the transmission lines. A concurrent alarm record is generated and deposited into the database.

Getting started with Access Manager

This section tells you about:

- Starting the On-Site Access Manager (pag e3-14)
- Logging on (page 3-16)
- Entering information into the screens (pag e3-18)
- Making a selection (pag e3-18)
- Exiting Access Manager (pag e3-19)
- Logging off (pag e3-19)

Starting the On-Site Access Manager

If you modified your **`AUTOEXEC.BAT`** file appropriately after you installed Access Manager, then Access Manager---and any associated programs---will start automatically when you power up your host PC.

If you didn't, then either:

- modify your **`AUTOEXEC.BAT`** file, as explained in "Creating a batch file for automatic start-up" on page 2 -9, or

- follow the procedure to manually start Access Manager:

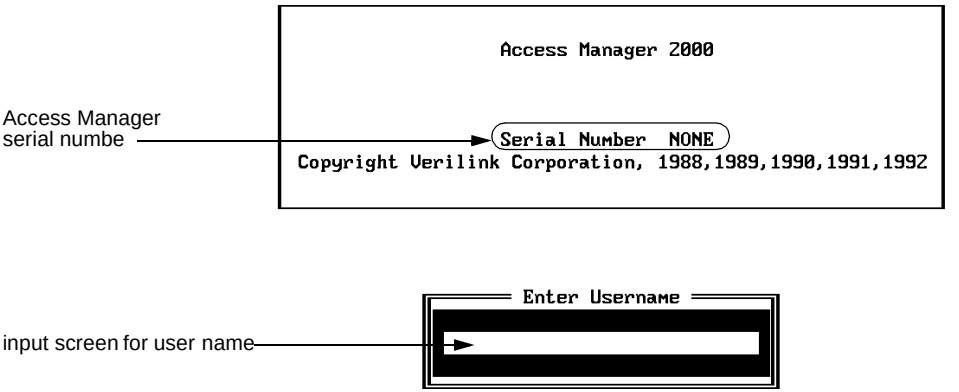
To manually start Access Manager:

1. Turn on and boot up your computer so that the operating system prompt (usually `C:>`) appears on the screen.
2. Type `CD AM2000` (or the name you assigned the directory where you installed Access Manager). Press Enter.
3. If you are using pcANYWHERE III, type `AN YWHEREAUTOMATIC`.

   Press Enter the program.
4. To start Access Manager, use one of the following commands:

If you are using a	Type:
color monitor with a color adapter card	`AM2000`
monochrome monitor with a monochrome adapter card	`AM2000/BW`
monochrome monitor with a color adapter card	`AM2000/BW`

After Access Manager is started, the *AM2000 Username* screen appears and prompts you to enter a user name to log into Access Manager.



When Access Manager is shipped from Verilink, the database has only one user name defined---LEVEL4. LEVEL4 has an access level of four.

5. Now you're ready to log on.

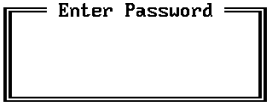
Logging on

To log on:

1. At the *AM2000 Username* screen, you need to enter a user name. If you still haven't typed a valid user name after three attempts, Access Manager exits to DOS.

   - If you are logging on to Access Manager for the first time, type LEVEL4 and press Enter.
   - If your system administrator has already set up user definitions in Access Manager, type your user name (up to 28 characters) and press Enter.

   After Access Manager accepts your user name, a password entry screen appears.

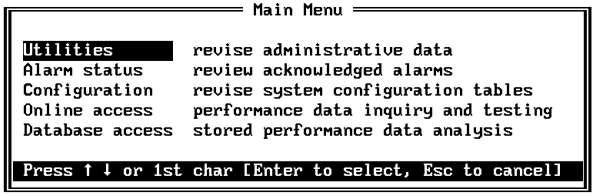


2. Type your password and press Enter.

   The password is hidden while you type it in. You have three chances to enter it correctly before Access Manager returns you to the *Username* screen.

   - If you are logging onto Access Manager for the first time, type TEST (the default password for user name LEVEL4).

After the user password is accepted, the *Main Menu* appears.


Main Menu
Utilities revise administrative data
Alarm status revieu acknouledged alarms
Configuration revise system configuration tables
Online access performance data inquiry and testing
Database access stored performance data analysis
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

3. You can now perform Access Manager operations as outlined in the chapters that follow.

4. If this is the first time Access Manager is started, enter the time and date (See *Chapter 4, Configuring Access Manager* for more information about the date and time menus).

5. This procedure is now completed.

Starting the Remote Access Manager

To manually start Access Manager from a remote VT100 terminal (or equivalent emulation):

1. Turn on and boot up your computer so that the operating system prompt (usually `C:>`) appears on the screen.

2. Type `CD AM2000` (or the name you assigned the directory where you installed Access Manager). Press Enter.

3. If you are using pcANYWHERE III, type `ANYWHERE AUTOMATIC`. Press Enter the program.

4. If you are using pcANYWHERE to control Access Manager from a remote VT100 terminal (or equivalent emulation), type `AM2000/BW/VT` and press Enter.

Note: *The /BW command may be optional for your setup. Refer to "Creating a batch file for automatic start-up" on p age2-9, for detailed information on the /BW command.*

When Access Manager is started in the VT100 mode, the bottom of the screen displays escape key sequences instead of function keys.

Note: *When Access Manager is started in the VT100 mode, the bottom of the screen displays escape key sequences instead of function keys.*

5. After Access Manager is started, the *AM2000 Startup* Screen appears and prompts you to enter a user name to log into Access Manager. Figure 3 -1, "Username Screen," on page 3-2 shows this screen.

Making a selection

All menu selections can be made by pressing the ↑ or ↓ keys to highlight the desired option and then pressing Enter at that option.

You can also select a menu option by typing the first character of that option, unless there are multiple options with the same first character. When multiple menu options appear with the same first character and you type that character, Access Manager always chooses the first option.

If an option is numbered, then typing that number will also select that option.

Entering information into the screens

Data entry fields are characterized by the type and maximum number of characters they accept. When the maximum number of characters is reached, the field is filled, the data is accepted, and the highlight moves to the next field.

If an invalid character type is entered in a field, the system beeps. This occurs, for example, if you try to enter an alphabetic character in an all-numeric field, such as a node number. The system also beeps if you are in the insert mode and the field is already full.

Note: *Typed spaces at the end of a field are treated by Access Manager as entered characters. Blanks at the end of a field may cause the system to beep. If this occurs, place the cursor after the last visible character and press to delete spaces.*

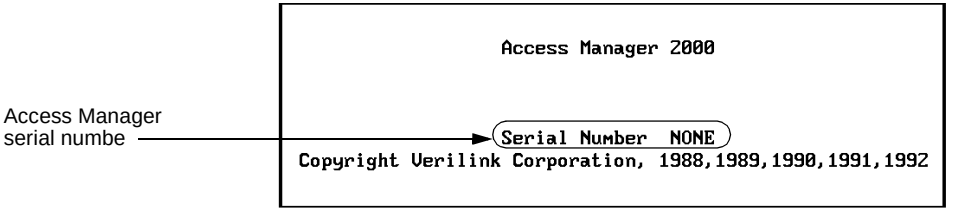
The ↑ ↓ may be used to move between lines from any character position. The cursor always positions itself to the left of the first character in the line selected.

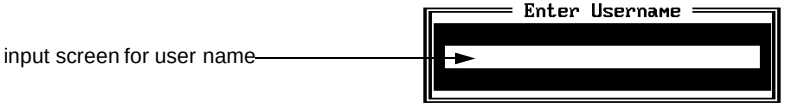
Any valid alphanumeric characters or symbols, including spaces, are valid in an alphanumeric field. A DOS filename is defined by any valid DOS character and filename.

Logging off

To log off Access Manager:

Press F9. You will ber returned to the *AM2000 Username* screen.





Exiting Access Manager

You cannot shut down Access Manager unless you are logged in with access at LEVEL4.

To shut down Access Manager:

1. Press F10 any place in the program except when a screen requests any key as a response. A warning message now appears.

2. To halt Access Manager and return to DOS, type **Y**. Any other response returns you to the *Main Menu.*

CAUTION

The F10 key must be used to exit from Access Manager. Do not shut down Access Manager by rebooting the computer; Doing so may corrupt the database.

Chapter

4

Configuring Access Manager

This chapter provides instructions for setting up Access Manager 2000. These operations are performed from the **Utilities** option of the *Main Menu*.

Configuration procedure overview

Configuration tasks

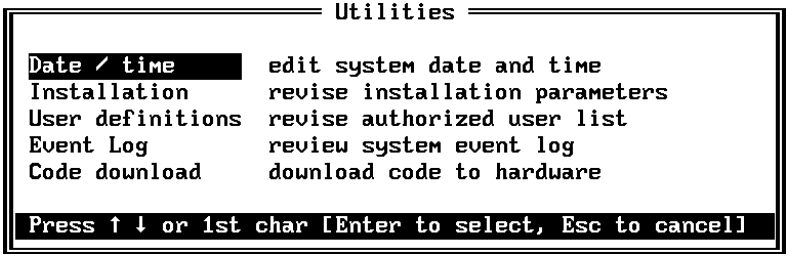
The tasks outlined in this chapter include:

- Setting the date and time (page 4-2)
- Configuring the site (pag e4-3)
- Updating user definitions (pag e4-23)
- Reviewing and archiving events logs (page 4-28)
- Downloading firmware to the nodes (pag e4-33)

Utilities Menu

To access the Utilities Menu:

- Select the **Utilities** option from the *Main Menu* by highlighting the option and pressing Enter, or by typing **U**. The *Utilities Menu* appears.



Setting the date and time

Access Manager uses DOS commands to update the system clock. On some computers, these DOS commands also update the hardware real-time clock.

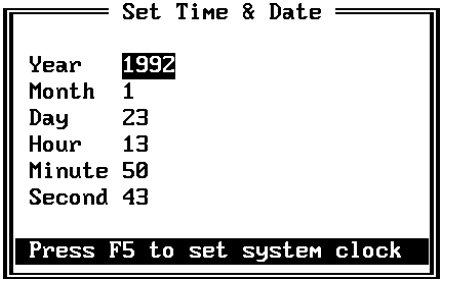
- If your system does not update the hardware clock through DOS commands, then you may have problems if your system is rebooted either deliberately or due to power loss.

  Therefore, to insure that your system clock remains correct, exit Access Manager and use the commands or utilities supplied with your computer to update the hardware clock.

- If your system has an accurate real-time clock, you probably don't need to set the date and time.
- If your system does not have a real-time clock and you did not set the time and date when you booted your system, the time and date may not be correct. Setting the time and date in this menu also sets the DOS time and date.

To set the date and time

1. From the *Utilities Menu*, select **`Date/Time`**. The *Set Time & Date* screen appears.



2. Enter the correct date and time.
   - To save the changes and set the system clock, press F5.
   - If you do not want to set the system clock, press F2 to return to the *Utilities Menu*.
3. The procedure is complete.

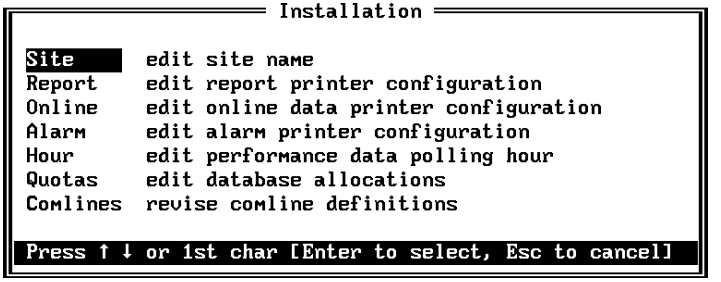
Configuring the site

Configuring the site includes the following activities:

- Differentiating the site (pag e4-3)
- Configuring the report printer (pag e4-5)
- Configuring the on-line data printer (page 4-8)
- Specifying the alarm destination (page 4-8)
- Setting the performance data polling hour (page 4-11)
- Assigning database allocations (page 4-12)
- Assigning comline definitions (page 4-14)

To configure the site, you'll need to access the *Installation Menu* from the *Utilities Menu*.

- From the *Utilities* menu, select **`Installation`**. The *Installation Menu* will appear.


Installation
Site edit site name
Report edit report printer configuration
Online edit online data printer configuration
Alarm edit alarm printer configuration
Hour edit performance data polling hour
Quotas edit database allocations
Comlines revise comline definitions
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

Differentiating the site

To differentiate the site, you need to assign the node a site name and a manager type.

The site name that you assign during this procedure will subsequently appear in the upper left corner of the monitor screen. Until you define the site name, the words **`NOT YET DEFINED`** will display on the monitor screen.

When a number of Access Managers have access to a given node, the node needs to know "who it's talking to". To do this, you need to identify each Access Manager by assigning it a **Manager Type**.

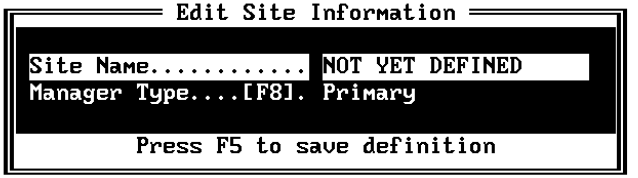
An Access Manager can be assigned one of three **Manager Types**: PRIMAR , SECONDAR , or TECHNICIAN.

- You would assign the types, PRIMARY and SECONDAR , to the two Access Managers which are to receive alarms.
- You would assign the **Manager Type**, TECHNICIAN, to an Access Manager that is not designated as one of the alternate alarm paths and is dialing in only to do diagnostics or troubleshooting from a remote location.

When a node controller sends an alarm to a PRIMARY or SECONDARY **Manager Type**, it subsequently deletes the alarm from its buffer. When a node controller sends an alarm to a TECHNICIAN **Manager Type**, it retains the alarm in its buffer until the diagnostics session is over and it has been able to send the alarm to the PRIMARY and/or SECONDARY Access Manager.

To differentiate the site:

1. From the *Main Menu*, go to the *Utilities Menu*.
2. From the *Utilities Menu*, select the **Installation** option.
3. From the subsequent screen, select the **Site** option. The following screen will appear.

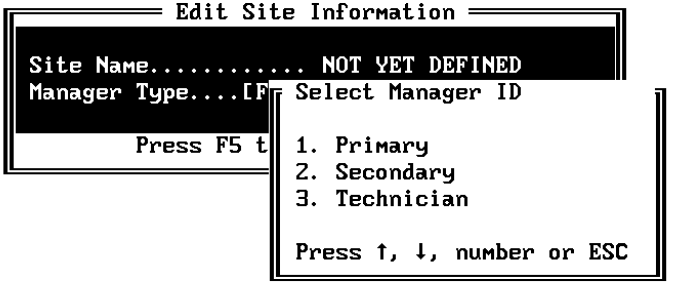


   You'll need to assign a **Site Name** and **Manager Type**.

   Until you assign the site name, the site name displays as **NOT YET DEFINED** in the *Edit Site Name* screen.

4. Type in the name you want to assign to your site. This name can be up to 20 characters long.

5. To see what **Manager Type** options are available, press F8. The following screen will appear.



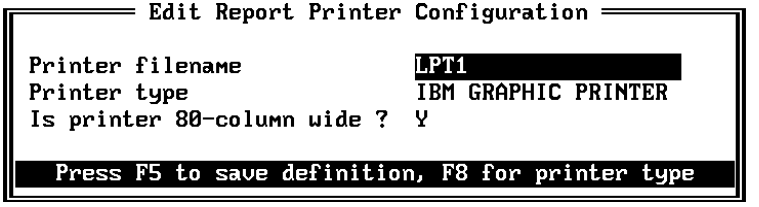
6. Assign a **Manager Type** to your Access Manager.
   - To save the site information, press F5. The site name will subsequently appear in the upper left corner of the screen.
   - If you don't want to change the site information, press F2 to return to the *Installation Menu*.
7. Your task is complete.

Configuring the report printer

The report printer is the printer that prints the performance data analysis and bar charts from information in the database. Database information can be viewed from the *Database Access Menu*.

To configure the report printer:

- From the *Installation* Menu, select **Report**. The screen labeled *Edit Report Printer Configuration* now appears.


Edit Report Printer Configuration
Printer filename LPT1
Printer type IBM GRAPHIC PRINTER
Is printer 80-column wide ? Y
Press F5 to save definition, F8 for printer type

Report output destination

The **Printer Filename** option specifies a destination for the report output. You can print to either:

- a parallel port (LPT1 or LPT2), or
- a disk file

You must use the DOS file naming convention to enter a file name or a full path name for a disk file. The **Printer Filename** field allows you to enter up to 20 characters: 8 characters for the file's name and the remaining 12 characters for the path. If the file name were **PRINT1.DOC** and the path were **C:\AM2000**, the entire filename would be **C:\AM2000\PRINT1.DOC**.

You should include the full DOS path even though it is not required.

- If a non-reserved name is specified, the report is saved to a disk file and may be accessed later.
- If a full DOS path is not included, the file is placed in the current directory.
- If a filename is specified and you press **F5** to save the definition, a file is created on disk with the name specified and zero bytes assigned. This is done to verify that the definition is correct and the file can be created.
- If the filename **NUL** or **NONE** is used, the output is discarded.
- If no printer is to be attached, then **NONE** should be entered to avoid the PC attempting to print to a non-existent printer and "freezing" in the process.

Enter a filename and press **Enter**.

Printer Type

Printer Type selects the type of printer used to print the data. This field is only valid when **LPT1** or **LPT2** is entered for the **Printer Filename** option.

Access Manager supplies drivers for five printers, but only one of the predefined printer types can be entered in this field at a time.

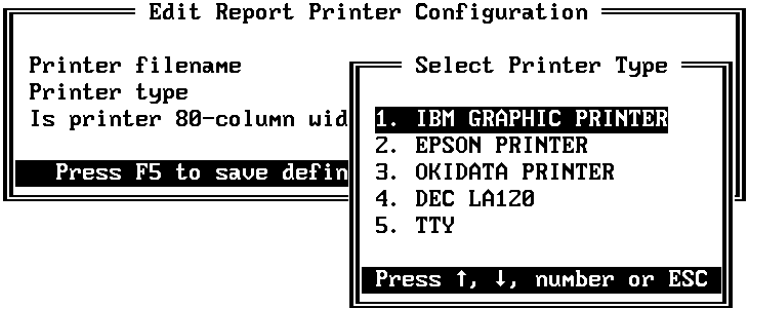
The only difference in the five printer types supported is in the characters used to program the printers for condensed (compressed) mode and to

restore them to normal mode (10 cpi). The hexadecimal values used for the printer types are listed as follows:

Printer Type	Condensed	Normal
IBM Graphic	0F	12
Epson	0F	12
Okidata	1D	1E
	These are for the 320/321 family of printers. The 190 family of printers use the values shown for the IBM or Epson printers and, therefore, should be installed as an IBM or Epson.	
DEC LA120	1B, 5B, 34, 77 (ESC 4w	1B, 5B, 30, 77 (E SC0w)
TTY	The TTY option is for printers that are unable to print compressed characters. Also, select TTY for a printer not listed or whose compressed character commands do not match any of those listed in the options table. Compressed characters are not used.	

1. With the cursor positioned on the **Printer Type** option, press F8 to display a window of the predefined printer types.

   A screen labeled **Select Printer Type** appears on top of the **Edit Report Printer Configuration** screen.



2. Place the cursor on the desired choice, and press Enter or press the selection number.

   If you use a name other than **LPT1** or **LPT2** and then press F5 to save the options, **NOT APPLICABLE** will appear in the **Printer Type** field.

Is Printer 80-Column Wide?

The **`Is Printer 80-Column Wide?`** data entry field appears in the **`Edit Report Printer Configuration`** screen. If you enter **`Y`**, the type may be compressed to print 132 columns on 8.5-inch paper, if supported by the printer type. Only those reports over 80 columns wide are compressed. Otherwise, the printer is set for 80 columns only. The number of lines is always 66.

When you are satisfied with the menu options and want to save them and exit from the *Installation Menu*, press F5. Or, press F2 to exit this menu without saving the changes. Records beyond the quota are deleted from the database when the F5 key is pressed.

Configuring the on-line data printer

The on-line printer is the printer that prints the performance analysis and bar charts from information in the elements (cards) themselves. This information can be viewed from in the *On-line Access Menu*.

To configure the report printer:

- From the *Installation Menu* select **`On-line`**. The *Edit On-line Printer Configuration* screen appears.

```
Edit Online Data Printer Configuration

Printer filename              LPT1
Printer type                  IBM GRAPHIC PRINTER
Is printer 80-column wide ?   Y

  Press F5 to save definition, F8 for printer type
```

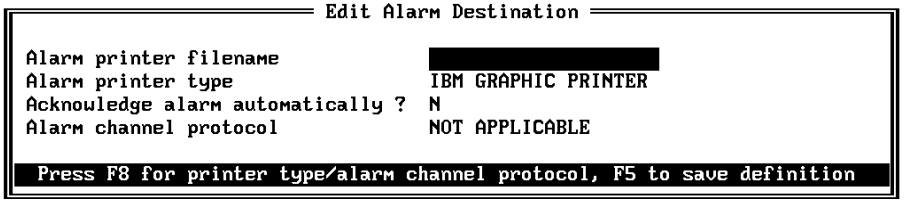
This screen defines where the on-line information is printed and what type of printer is used. The selections and menu are the same as in the **`Edit Report Printer`** option described in the previous section. Refer to that section for an explanation of the menus and choices.

Specifying the alarm destination

You can specify whether alarm reports go to a printer, file, or a computer. This is done through the *Edit Alarm Destination* screen.

To select where you want the alarms to go:

- From the *Installation Menu*, select **`Alarm`**. The *Edit Alarm Destination* screen will appear.



Sending alarms to a printer or file

To output the alarm report to a printer or to a file:

- Follow the same rules for **`Alarm Printer Filename`** and **`Alarm Printer Type`** as you did for **`Printer Filename`** and **`Printer Type`** in "Configuring the report printer" on page 4-5, earlier in this chapter.

Sending alarms to a computer

You can choose to output alarm messages to another computer, such as one running Accumaster.

Before attempting to configure Access Manager to send alarm reports to another compute , you must first enter **`SERIAL DEVICE`** for the **`Access Arrangement of a Comline`** in the *Comlines Definition* screen. In other words, the only time you can use **`COMx`** (where **`x`** is a number) in the **`Alarm Printer Filename`** field is when you have defined the comline for a serial device.

CAUTION

However, if you're using an actual serial printer, you cannot use a name such as `COM1` in the `Alarm Printer Filename` field. If you do, Access Manager may halt. Instead, you must enter `LPT1` or `LPT2` in the *Edit Report Printer Configuration* screen, and then use the MODE command from DOS to redirect the LPT port to a non-

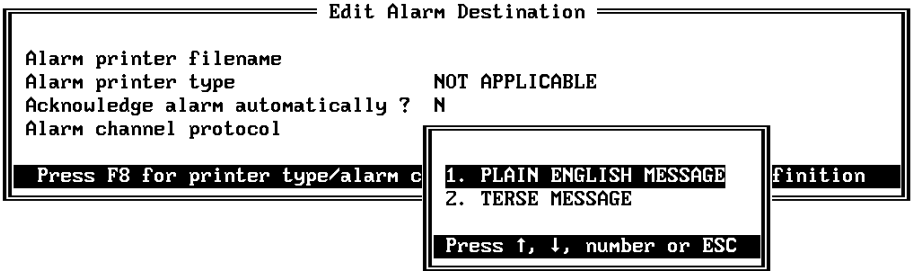
Digiboard COM port. Refer to the DOS manual for proper use of the MODE command. Do not duplicate filenames listed in Table 2-1, "Access Manager Installation Files," on page 2-4.

To output alarm messages to another computer:

1. In the **`Alarm Printer Filename`** field, enter the comline name.
2. Leave the **`Printer Type`** field blank. It is not applicable.

Alarm Channel Protocol

The **`Alarm Channel Protocol`** data entry field appears in the *Editing the Alarm Destination* screen. The **`Alarm Channel Protocol`** option is selected by moving the cursor to that line and pressing (F8) to bring up the selection **`Alarm Channel Protocol`** screen.



If you are using a serial or parallel printe , select the **`PLAIN ENGLISH MESSAGE`** option. This sends the entire alarm information in ASCII format. The alarms are printed one alarm message per line.

If you are outputting to a serial port or disk file, select the **`TERSE MESSAGE`** option. This sends information in the following formats:

- the date, time, and node name alarm output in an ASCII format, and
- the alarm status in an ASCII-formatted hexadecimal format.

  Do not use this option with a serial or parallel printer.

Note: *Refer to Appendix C, "Alarm Report Record Format", for a description of the alarm printout format.*

If your Access Manager includes Accumaster protocol compatibilit , the **`Edit Alarm Destination`** screen includes a third option, **`Accumaster Protocol`**. If **`Accumaster Protocol`** is selected, the alarms are sent to the Accumaster system. This protocol uses flow control to hold off sending data to Accumaster when requested by Accumaster. If the connection to Accumaster is disconnected, alarms are stored in the Access Manager 2000 database until the Accumaster connection is re-established, at which time all uncleared alarms are sent to Accumaster.

Note: *The Accumaster Protocol option is available only in the Access Manager-1000 package.*

Except when the *Accumaster Protocol* is chosen, the port sending alarm messages does not use communication flow control or handshaking.

Alarm acknowledgement: Manual or automatic?

The **`Acknowledge Alarm Automatically?`** data entry field appears in the *Editing the Alarm Destination* screen. This option specifies the default setting for the alarm status shown at the top of the screen when a user logs onto Access Manager. To select the automatic mode, type **Y**.

Once you are logged on, press **F4** to toggle between the manual and automatic modes. In the automatic mode, when an alarm occurs, you briefly see the alarm processing message.

Setting the performance data polling hour

Access Manager collects DS1 performance data every 12 hours and discards duplicate data collected during any 24-hour period. It polls all equipped nodes at the same hour in alphanumeric order. If the connection to a node fails, polling for that node is rescheduled up to three times after all other nodes are polled, for a total of four polling attempts.

Access Manager collects data only from CSUs that meet certain conditions:

a. The CSUs must be configured as **`Installed and Operational`**.

b. The CSUs must have collection of performance data enabled.

c. The parent nodes of the CSUs must be configured as **`Installed and Operational`**.

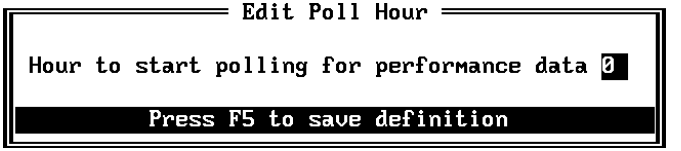
For circuit elements accessed through the 4-kbps ESF Data Link, a circuit must be built between the near and far circuit elements in order to collect far-end data. This is because all data is stored under the circuit element's parent node name.

Note: *To retrieve data from a far-end CSU, the near-end CSU must be set to retrieve data.*

You must specify the hour when the 12-hour polling cycle for collection of performance data is initiated.

To specify the polling hour:

1. From the *Installation* screen, select **Hou** . The *Edit Poll Hour* screen appears.



2. Choose one of the following options:

   - To specify the polling hou , enter a value from 1 to 12 for the polling hour from 1 to 12, and press F5 to save the value.
   - To disable performance data polling, enter **ZERO** or a number equal to or greater than 13.
   - To exit from this option without saving changes, press F2 .

Assigning database allocations

The Access Manager database provides space for the event log, alarm log, and performance database (that is, log). You may allocate how much space is given to each log.

The default allocations, at time of shipment, are shown in Table 4-1, "Database allocation at time of shipment," on page 4 -13.

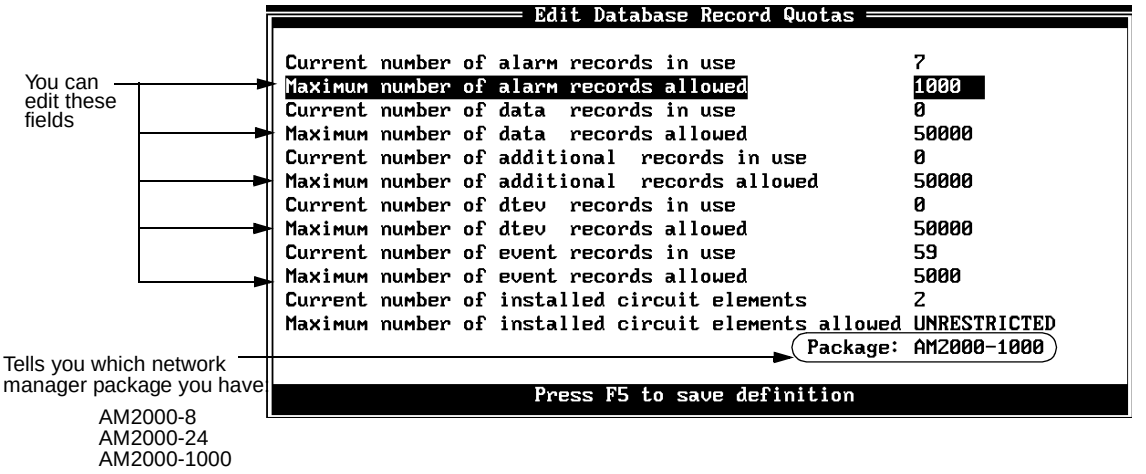
Table 4-1 Database allocation at time of shipment

Type of record	Number or records per log (default)	Maximum size of record
Event	5,000	58 bytes
Alarm	10,000	62 bytes
Performance (3 kinds)		
• data (also known as user records)	50,000	150bytes
• additional	50,000	150bytes
• dtev (also known as EQP records)	50,000	150bytes

Each of the three categories of performance records can be edited separately.

To assign database allocations:

1. From the *Installation* screen, select **Quotas**. The screen labeled *Edit Database Record Quotas* now appears.


Edit Database Record Quotas
Current number of alarm records in use 7
Maximum number of alarm records allowed 1000
Current number of data records in use 0
Maximum number of data records allowed 50000
Current number of additional records in use 0
Maximum number of additional records allowed 50000
Current number of dtev records in use 0
Maximum number of dtev records allowed 50000
Current number of event records in use 59
Maximum number of event records allowed 5000
Current number of installed circuit elements 2
Maximum number of installed circuit elements allowed UNRESTRICTED
Package: AM2000-1000
Press F5 to save definition
You can edit these fields
Tells you which network manager package you have
AM2000-8
AM2000-24
AM2000-1000

The *Edit Database Record Quotas* screen also displays, but does not permit you to change the following:

- The current number of records of each type in use (that is, stored in the database)

- The current number of installed CSU circuit elements (that is, configured in the database as **`Installed and Operational`**)
- The maximum number of CSU circuit elements which your Access Manager Package permits to be installed. If there is no restriction in the package, this is shown as **`UNRESTRICTED`**.

The type of Access Manager package you have is shown last. This can be **`AM2000-8`**, **`AM2000-24`**, or **`AM2000-1000`**.

When the current number of records reaches the maximum allowed, no new records will be added. You may increase the maximum number of records allowed to prevent loss of data, or you may choose to take some time to archive or delete the older data.

2. Adjust the maximum allowable record numbers as needed.
3. Select one of the following actions:
   - To save the changes made, press **F5**. The changes are saved, and the current records used counts are updated.
   - To exit the menu without saving the changes, press **F2**.
4. If you do not increase the allocations, you may reduce the records in use by saving them to another file using the **`Archive`** function.

Assigning comline definitions

A ***comline***, or communication line, is a serial port on your computer. It is used to transmit to or receive data from a network node or another computer through an Electronic Industries Association (EIA) standard RS232 interface.

When you assign a comline definition, you specify what protocol, or "language", the port will be using to communicate with any device connected to it.

Access Manager 2000 supports 1 to 16 comlines operating at the following rates:

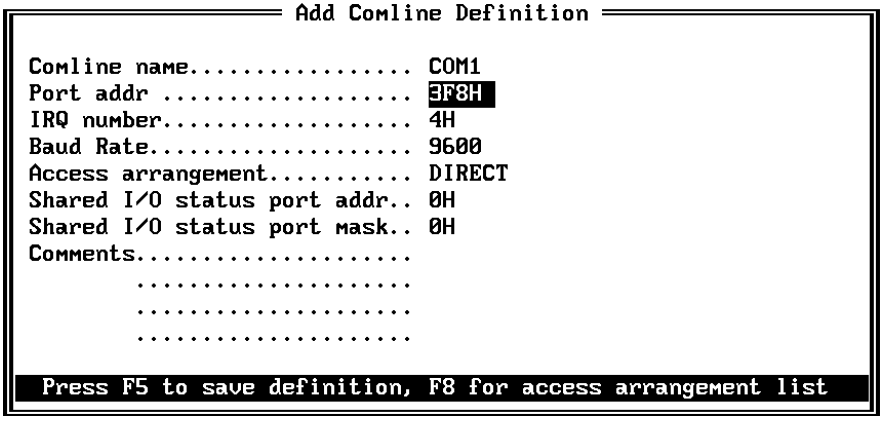
Comlines operating at:	**Support these connections:**
1200 baud	• direct • ComDesign Multiplexer • modem
2400 baud	• modem
9600 baud	• direct • multiplexer • modem (NCC 2020 controller only • X.25PAD (NCC 2020 controller only

The following are supported if no handshake protocol is used:

- Leased-line circuits using full-time modems. This configuration is specified as **`DIRECT`** under the **`Access Arrangement`** option.
- Circuits that are direct-connected using short-haul modems operating at 9600 baud.

Note: *Before defining a Comline in the Access Manager database, make sure the printed circuit board with the serial port(s) is installed in your personal computer. Refer to AppendixD, "Installing Serial Ports" for instructions on installing a standard serial board or DigiBoard DigiCHANNEL board in your Personal Computer.*

The database is shipped with only COM1 installed. The following screen shows the default definition for COM1 on an IBM PC, PS/2, or 100% IBM-compatible.

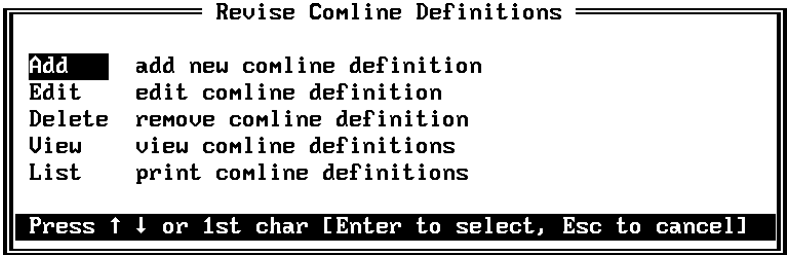


All numeric entries, except the baud rate, are in hexadecimal and are followed by an "H". You can enter the "H" manually, or the program will automatically enter it. The Comline definition is made up of numerous variables. To change any variables, continue with the following sections.

You can do the following:

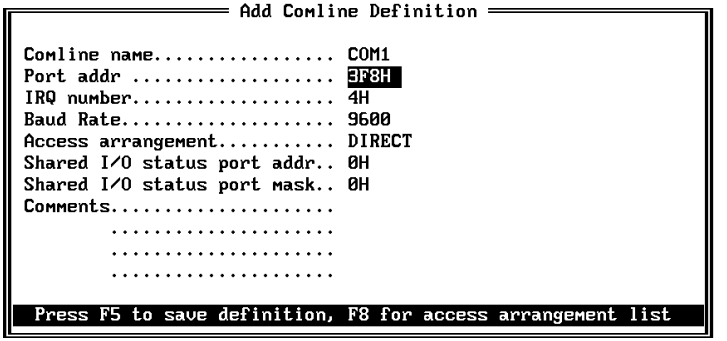
- *Add* one or more comlines
- *Edit*, *delete*, or *view* existing comlines
- *List* (print) all the comlines that have been defined

From the *Installation* screen, select **Comlines**. The screen labeled *Revise Comlines Definitions* appears.


Revise Comline Definitions
Add add new comline definition
Edit edit comline definition
Delete remove comline definition
View view comline definitions
List print comline definitions
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

Adding a new comline definition

1. From the *Installation Menu* select **Comline**.
2. From the *Revise Comline Definitions* screen, select **Add**.
3. The *Add Comline Definition* screen appears, showing the default value for each item listed.


Add Comline Definition
Comline name..... COM1
Port addr 3F8H
IRQ number..... 4H
Baud Rate..... 9600
Access arrangement..... DIRECT
Shared I/O status port addr.. 0H
Shared I/O status port mask.. 0H
Comments.....
Press F5 to save definition, F8 for access arrangement list

- If no other Comlines were previously defined, COM1 appears as the Comline name in this screen.
- If other Comlines were previously defined, the screen shows the next highest available Comline (COM2 through COM16, as appropriate).

CAUTION

If Access Manager 2000 is accessed remotely by Accumaster or a remote terminal, COM1 is the remote access port. It must be configured in the host PC setup of pcANYWHERE III. It is not configured in the database. Therefore, when using Access Manager in a remote access mode, assign COM2 and successive comline from Access Manager as described in the following paragraphs, and delete COM1 from the database.

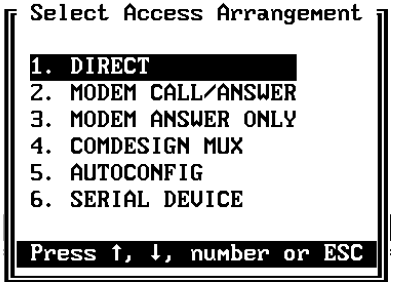
Note: *The Comlines must be added in consecutive numeric order.If a Comline name greater than COM16 is used, the message COMLINE NAME MUST BE COMx (where x is 1 to 16) appears.*

The following data entry fields appear in the *Add Comline Definition* screen:

Field Name	Meaning
`Comline name`	The Comline name can be COM1 through COM16. No other values are accepted by Access Manager.
`Port Addr`	This is the port address of the serial interface. Refer to the manual supplied with your computer or to Appe ndixD, "Installing Serial Ports" for this address.
`IRQ Number`	The IRQ number is the interrupt request number of the serial interface. For the IRQ number, refer to the manual supplied with your computer or to Appe ndixD, "Installing Serial Ports".
`Baud Rate`	This field specifies 1200, 2400, or 9600 baud for use by the serial interface.
`Access Arrangement`	Access Arrangement specifies the type of connection at each serial ports of the Access Manager PC. All of the comlines, except *SERIAL DEVICE*, are connected to nodes or devices to which nodes are connected. The *SERIAL DEVICE* connection services another compute or an Accumaster. Further details are outlined below.

To display the access arrangement(s):

1. Place the cursor on the **`Access Arrangement`** option.
2. Press F8. The screen showing possible access arrangements appears.



The connection choices and their descriptions are as follows:

Type of connection	Description
`Direct`	Either: • Hardwired to a node. • Connected to a node through a pair of full-time (dedicated) modems using a dedicated facility. • Connected to a node via a dedicated port into a multiplexer and conveyed in the multiplexer's payload.
`Modem Call/Answer`	This choice provides dial-out call to a node and dial-in call from a node. A *Modem Call/Answer* Comline uses the Hayes® AT command set at 1200, 2400, or 9600 (for AS2000 equipment only) baud. If a combination of 1200-baud and 2400-baud call/answer modems are connected to the computer, install the 2400 baud modems with higher Comline numbers than the 1200-baud modems. If answer-only modems are connected, install them with higher Comline numbers than the call/answer modems. If multiple modems are used for alarm reporting, their phone lines should be installed by the telephone company or in a PBX (direct inward dial) as a hunt group. This allows the hunt group master number to be used as an alarm report number for all nodes. If you configure a Comline for 9600 baud, that comline cannot be used to query a node configured for 1200 baud although on incoming calls to Access Manager, a 9600-baud modem adapts to the baud rate (1200, 2400, or 9600) of the incoming call.
`Modem Answer Only`	Dial-in call (from a node) only. A *Modem Answer Only* Comline (normally used with INWATS lines) uses the Hayes® AT command set on a modem at 1200, 2400, or 9600 baud.
`ComDesign Mux`	Connection to multiple nodes through a routing multiplexer such as a ComDesig nRS2000 Statistical Multiplexer. Refer to the ComDesign Multiplexer manual for proper configuration of the multiplexer.
`X.25 PAD`	For use with AS2000 (NCC 2020) only.

Type of connection	Description
Autoconfig	Access Manage automatically determines if the *Access Arrangement* is DIRECT,MODEM CALL/ANSWER, or COMDESIGN MUX. When the AUTOCONFIG option is chosen, the order of automatic configuration attempts is as follows: • ComDesign Multiplexer at 9600 baud • Modem at 2400 baud • Modem at 1200 baud • Direct Connection at 9600 baud (Default selection The automatic configuration procedure takes up to one minute. If none of the options are successful, the default is chosen (#4). The failure to AUTOCONFIG could be caused by any of the following: • Option setting on modem set incorrectly. See Append ixB, "Modem Configuration" for the proper modem settings. • ComDesign Multiplexer port not configured correctly. See the ComDesign manual for proper port configuration. (The port names assigned in the multiplexer must be the same as the names assigned in Access Manager. • Access equipment (ComDesign Multiplexer or modem) not connected to host PC. Connect the equipment, and retry auto-configuration.
Serial Device	Serial output-only connection with no flow control. A *Serial Device* Comline sends alarm messages to a printer or to another computer using the Accumaster protocol.
Shared I/O Status Port Address	This data entry field is used for interface boards containing more than one serial port and using a shared I/O status port and interrupt (IRQ). Appe ndixD, "Installing Serial Ports", gives the correct shared I/O status port addresses for each port number.
Shared I/O Status Port Mask	This data entry field is used for interface boards with more than one serial port and using a shared IRQ number and shared I/O status port address. Appe ndixD, "Installing Serial Ports" gives the correct shared I/O status port masks fo each port number.
Comments	Up to four lines of alphanumeric comments and spaces can be entered, with 30 characters per line. This field does not affect operation of the Comline.

A note about AS2000 or ConnecT1 Plus:

If the node is an AS2000 type, daisy-chained to other AS2000 type nodes, the daisy chain connection to the first node must be direct, and Modem

Call/Answer, Modem Answer Only, ComDesign Mux, and Autoconfig are not available for the second and third nodes.

Access Manager uses Hayes® protocol for modems. If the phone number is not preceded by an alpha character, Access Manager assumes that the phone line in use is a dual-tone multifrequency (DTMF) line and prefixes the phone number with the characters ATDT. However, if the phone line requires dial pulsing, you must enter the prefix ATDP to the number yourself. Refer to the modem manual for more information on how to use these commands. This number should include an access prefix followed by a comma if the lines are connected to a PBX. The comma causes the modem to pause for a set time period to allow for a second dial tone after dialing the access prefix.

Since **`Access Arrangement`** controls only the host computer (i.e., PC) end of the Comline, it is necessary to assure that equipment at both ends of the connection be set for the correct access arrangement. See the Verilink *SIM, NC/E, 551VST List 2 , 551VST ML List 1, 551VST ML List 2*, and *Access System 2000* Manuals.

Editing a comline definition

1. Starting from the *Main* Menu, select *Utilities.*
2. From the *Utilities* Menu, select **`Installation`**.
3. From the *Installation* Menu, select **`Comline`**.
4. From the *Revise Comline Definitions* screen, select **`Edit`**. A list of currently defined Comlines now appears.
5. From this list, choose the comline to be edited by highlighting it and pressing **Enter**. The current comline definition option settings are now listed.

Note: *The allowable entries for the Comline definition options ar determined by the computer and peripheral boards used by Access Manager. AppendixD, "Installing Serial Ports" lists the permissible entries for the standard computer and peripheral board configurations.*

Using the entries listed in Appendix D , 'Installing Serial Ports", edit the comline definition options as described in Adding a new comline definition" on page 4-17.

Deleting a comline definition

1. From the *Utilities* Menu, select **Installation**. From the *Installation* screen, select **Comline**. The screen labeled *Revise Comline Definitions* will appear.

2. From the *Revise Comline Definitions* screen, select **Delete**. The *Select Comline to Delete* screen now appears.

3. Highlight the comline to be deleted and press Enter.

   A warning message with the Comline and system port number now appears, asking you to confirm that you want to delete it.

```
WARNING!
If you are sure that you want to delete COM1, please press 'y'.
Press any other key to cancel this request.
```

4. Choose one of the following actions:

   - To delete the displayed comline, type **Y**.
   - To cancel the request, press any other key

CAUTION

With a PS/2 using DigiCHANNEL MC/4 or MC/8 boards, Comline must be deleted in reverse order from the order in which they were installed. The highest COM number on a board (Port 4 for MC/4 an Port 8 for MC/8) must be deleted first and then 7, 6, 5, 4, 3, 2, 1. Failure to remove the Comlines in the correct order prevents Access Manager from using any ports after the deleted ones.

5. After a comline is deleted, the system returns to the *Select Comline to Delete* screen so that you can delete more comlines.

6. When you have finished deleting comlines, press F2 to return to the previous menu.

Viewing comline definitions

This option allows you to view how you have configured your comlines. Use the same procedure as described earlier (“Editing a comline definition” on pa ge4-21) except select **`View`** rather than **`Edit`**.

Listing (printing) comline definitions

This option allows you to print the configuration of your comlines from the report printer. Use the same procedure as described earlier, except select **`List`** rather than **`Edit`**.

Updating user definitions

The **`User Definitions`** option allows you to *add*, *delete*, or *modify* Access Manager user names and their associated passwords and access levels. Only a user with Level 4 access can access this menu to change the passwords and access levels for defined users.

The user names, passwords, and access levels are encrypted in the database to prevent viewing them with an ASCII file editor.

User Name

The **`User Name`** data entry field appears in the *Add New User* screen. Each user name can have up to 28 alphanumeric characters. Each user name defined in Access Manager can have a separate password associated with it.

Password

The **`Password`** data entry field appears in the *Add New User* screen. Each user password can have up to 20 alphanumeric characters.

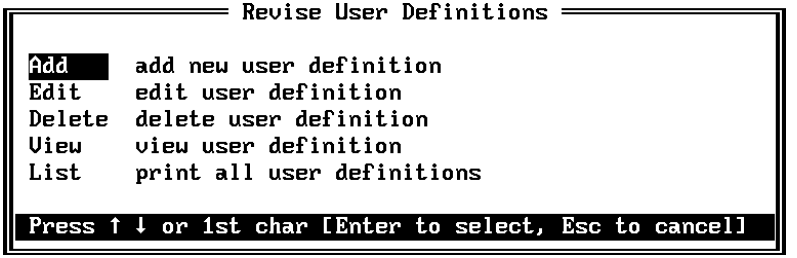
Access Level

The **`Access Level`** data entry field appears in the *Add New User* screen. Each user name has a certain level of access associated with it.

The access level of the current user is shown in the lower right box of each screen. Four access levels are possible, each permitting a user to perform certain operations. These levels are as follows.

Access Level and Definition	Functions
Level 1 Read information	Information can be retrieved but registers cannot be reset, and working parameters and options cannot be modified.
Level 2 Read with limited parameter modifications	Allows Level 1 capabilities, plus non-service-affecting functions and parameter modifications, such as resetting performance registers and enabling circuit element retrieval of performance data. On color monitors, the selected screens show parameters that can be modified in blue and parameters that cannot be modified in red. On monochrome monitors, the parameters that can be modified appear as highlighted characters and the parameters that cannot appear in normal characte mode.
Level 3 Read with parameter modifications	Allows Level 1 and 2 functions plus service-affecting functions (for example, loopback or testing), and parameter modifications (for example, network element configuration).
Level 4 System manager	Level 1 through 3 functions plus addition and deletion of users, changing passwords and access levels, performing all system installation and archive functions, and shutting down the system. Access Manager doe not allow the system to be modified in such a way that no system manager access level exists.

From the *Utilities* Menu, select **`User Definitions`**. The screen labeled *Revise User Definitions* appears.


Revise User Definitions
Add add new user definition
Edit edit user definition
Delete delete user definition
View view user definition
List print all user definitions
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

Viewing the user definitions

Starting from the *Main* Menu, select *Utilities*. From the *Utilities* Menu, select **`User Definitions`**. From the *Revise User Definitions* screen, select **`Vie`** . You then see the existing user names, passwords, and current access levels.

Listing the user definitions

To print a list of existing user names, passwords, and current access levels:

1. Starting from the *Main Menu*, select **`Utilities`**. The *Utilities Menu* will appear.
2. Select **`User Definitions`**. The *Revise User Definitions* screen will appear.
3. Select **`List`**. This will cause the report printer to output a list of the information.

Deleting a user definition

To delete a user definition:

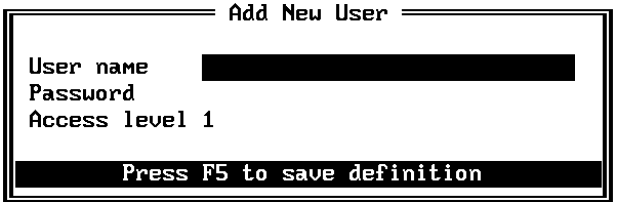
1. Starting from the *Main Menu*, select **`Utilities`**.
2. From the *Utilities Menu*, select **`User Definition`***s*.
3. From the *Revise User Definitions* screen, select **`Delete`**. You then see the list of existing users.
4. Highlight the user name you want to delete, and then press Enter. The delete confirmation prompt appears at this time.
5. Choose one of the following actions:
   - To confirm the deletion, type **`Y`** at the prompt.
   - To cancel the deletion, press any other key.

Note: *You are prevented from editing or deleting user names and access levels so that there is not at least one access Level 4 user remaining in the database.*

Adding a user definition

To add a user definition:

1. From the *Revise User Definitions* screen, select **Add**. The screen labeled *Add New User* now appears.



2. Enter the user name, password, and access level. Choose one of the following options:

   To save the definition, press F5.

   To exit without saving, press F2.

3. The user names, passwords, and access levels are encrypted in the database to prevent viewing them with an ASCII file editor.

The default user definitions shipped with the Access Manager database include the following:

- User Name: LEVEL4
- Password: TEST
- Access Level: 4

The default access level for all new users is Level 1.

Not all of the options are displayed on some sub-menus for users with an access level lower than LEVEL4. For example, the following two figures show two typical screens that appear for LEVEL1 access users.

Figure 3-6 Utilities Menu for a LEVEL1 Use

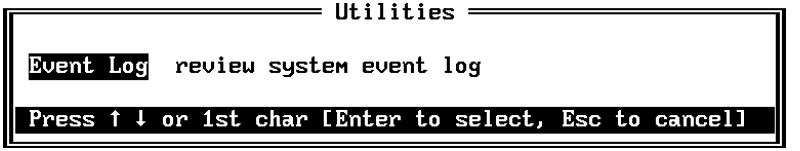
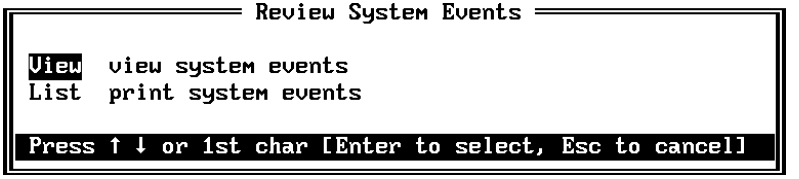


Figure 3-7 Review System Events Menu (Level 1 User)



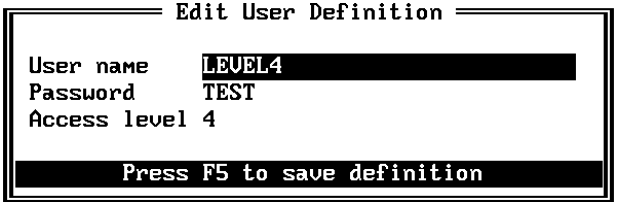
These screens generally allow Level 1 through Level 3 users to view and list items, but not to delete or archive them.

Editing a user definition

If you have LEVEL4 access, you can edit an existing user name, password, and access level.

To edit a user definition:

1. From the *Revise User Definitions* screen, select **Edit**. The *Select User to Edit* screen appears. This screen (not illustrated here) shows the existing user names, passwords, and access levels.
2. Use the directional keys to select a user name.
3. Press Enter. The screen labeled *Edit User Definition* now appears.



4. Make the changes you want.

- To save the changes, press F5.
- To abort the changes, press F2.

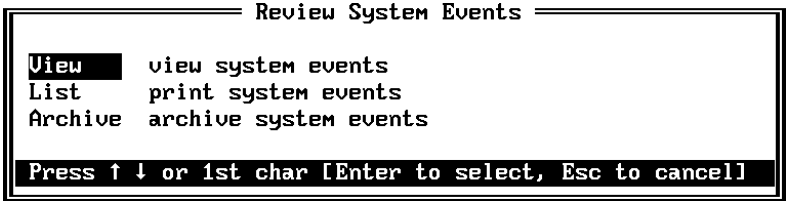
Reviewing and archiving events logs

Each time a system event occurs, a record is made in the database. System events include:

- system start-up
- system shutdown
- user log in
- user log out
- the start and finish of scheduled data polling for each node and circuit element

Access Manager lets you view, list, or archive Event Log Records.

From the *Utilities Menu*, select **`Event Log`**. The *Review System Events* screen appears.

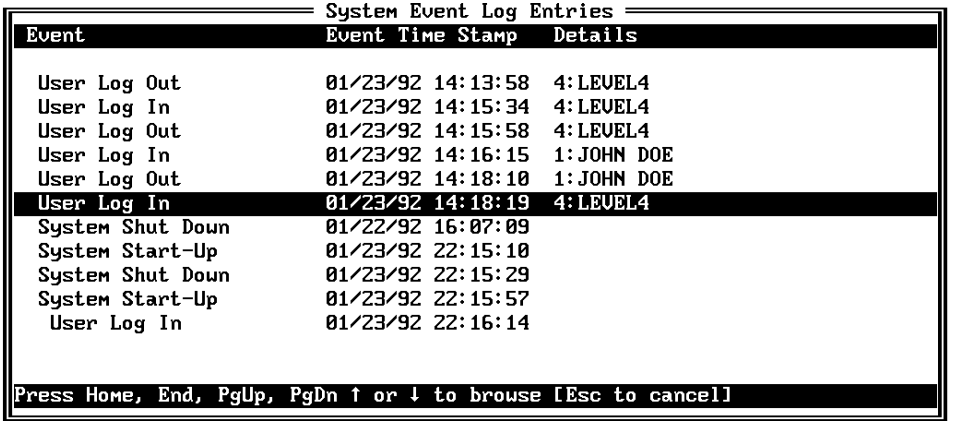

Review System Events
View view system events
List print system events
Archive archive system events
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

Viewing system events

To view system events:

1. From the *Utilities Menu*, select **`Event Log`**.

2. From the *Review System Events* screen, select **Vie** . The *System Event Log Entries* screen now appears.


System Event Log Entries
Event
Event Time Stamp
Details
User Log Out 01/23/92 14:13:58 4:LEVEL4
User Log In 01/23/92 14:15:34 4:LEVEL4
User Log Out 01/23/92 14:15:58 4:LEVEL4
User Log In 01/23/92 14:16:15 1:JOHN DOE
User Log Out 01/23/92 14:18:10 1:JOHN DOE
User Log In 01/23/92 14:18:19 4:LEVEL4
System Shut Down 01/22/92 16:07:09
System Start-Up 01/23/92 22:15:10
System Shut Down 01/23/92 22:15:29
System Start-Up 01/23/92 22:15:57
User Log In 01/23/92 22:16:14
Press Home, End, PgUp, PgDn ↑ or ↓ to browse [Esc to cancel]

The cursor will be positioned at the center of the menu on the last event recorded.

3. Use the PgUp and PgDn keys and cursor keys to view the events in the log.

Listing system events

1. From the *Utilities Menu*, select **Event Log**. The *Review System Events* screen appears.
2. Select **List**.

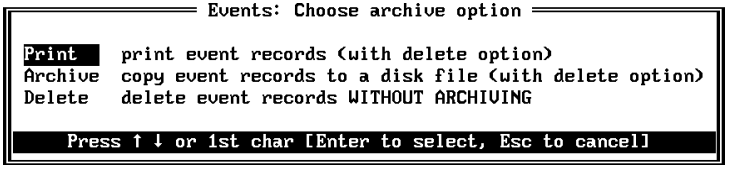
   All system events are printed from the report printer.

Archiving system events

Only a LEVEL4 user may archive files.

1. From the *Utilities Menu*, select **Event Log**. The *Review System Events* screen appears.

2. Select **Archive**. The screen labeled *Events: Choose Archive Option* appears.


Events: Choose archive option
Print print event records (with delete option)
Archive copy event records to a disk file (with delete option)
Delete delete event records WITHOUT ARCHIVING
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

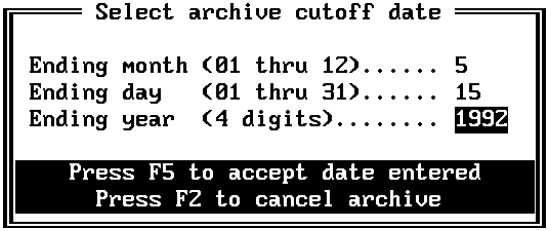
This screen has 3 options: **Print**, **Archive**, and **Delete**.

Printing event records

When you print all event records, you can elect to retain or delete the printed records.

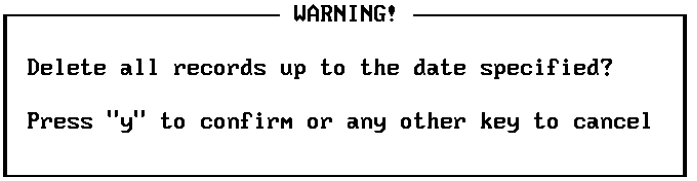
To print event records:

1. In the *Events: Choose Archive Option* screen, select the **Print** option. The screen labeled *Select archive cutoff date* appears, showing the current date.


Select archive cutoff date
Ending month (01 thru 12)..... 5
Ending day (01 thru 31)..... 15
Ending year (4 digits)..... 1992
Press F5 to accept date entered
Press F2 to cancel archive

2. Enter the desired cutoff date, and press F5 to accept it. All event log records up to midnight of the selected date are printed. The printer as used in this context can be defined as a file on the hard disk in the *Report Printer Definition* screen.

3. After all selected records are printed, a warning message appears, prompting you to confirm deletion of all records up to the chosen cutoff date.



4. Choose one of the following actions:

   - To delete all records up to and including the cutoff date selected, type **Y**.
   - To cancel the **Delete** function, press any other key.

Archiving event records

The *Event Log* records are archived in an ASCII, comma-delimited format. The format is compatible with Lotus 1-2-3, dBase III Plus, and other similar spreadsheet software. The file names use the format LOyymmdd.XXX, where:

- LO is always the first two letters
- yy = the year of the archive
- mm = the month of the archive
- dd = the day of the archive
- XXX = extension, consecutively numbered from 001 to 999

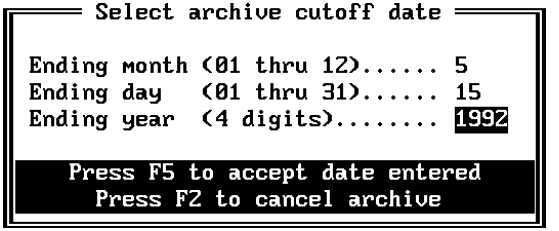
The month, date, and year used in the archive file name are those selected in the *Archive Cutoff Date* screen, not the current date.

Each time archiving is executed, it starts with a file extension of ".001". If a previous event log archive has been performed with the same cutoff day, the previous archive files (which also started with extension .001) are overwritten if they exist on the same disk and directory.

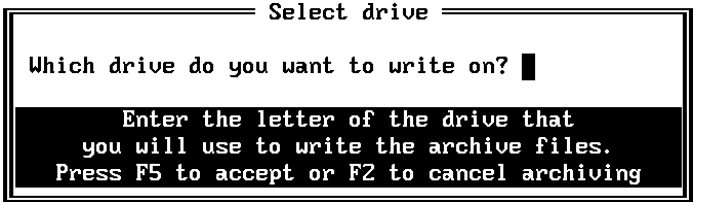
Refer to Appendix E, "Archive File Formats", for a detailed description of the event log record format.

To archive event records:

1. From the *Events: Choose Archive Option* screen, choose the **Archive** option. The *Select Archive Cutoff Date* screen appears.


Select archive cutoff date
Ending month (01 thru 12)..... 5
Ending day (01 thru 31)..... 15
Ending year (4 digits)..... 1992
Press F5 to accept date entered
Press F2 to cancel archive

2. Enter the cutoff date. When you press F5 to accept the data you entered, the screen labeled *Select Drive* appears.


Select drive
Which drive do you want to write on?
Enter the letter of the drive that
you will use to write the archive files.
Press F5 to accept or F2 to cancel archiving

   If you pressed F2 to cancel the archiving, the previous menu appears.

3. You can archive the event log records to any drive on your system. If the selected drive is the same as the one from which Access Manager is started, the archived files are placed in the directory. If a different drive is selected, the files are placed in the root directory of the selected drive.

   Specify the disk to which the event records are to be archived.

   - To copy the previously selected records from the oldest date to the cutoff date) to a file on the selected disk, press F5.
   - To cancel the archiving function, press F2. This will return you to the previous menu.

4. After the records are completely archived, you are asked to confirm that the archived records should be deleted from the database.

   - To confirm the deletion, type **Y**.

- To cancel the deletion, press any other key.

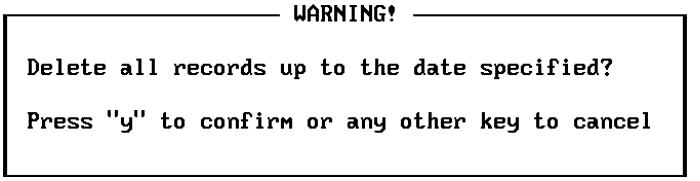
Deleting event records without archiving

The **Delete** option deletes event records from the database without printing or archiving them.

To delete event records without archiving:

1. In the *Events: Choose Archive Option* screen, select the **Delete** option. The *Select Archive Cutoff Date* screen appears.

2. Enter the cutoff date. When you press **F5** to confirm the data, a warning message appears, asking you to confirm the deletion.



3. Type **Y** to continue with the record deletion process, or press any other key to abort record deletion.

   If **Y** is typed, the selected records (from the oldest date to the cutoff date) are deleted.

Downloading firmware to the nodes

Code Download, also referred to "Download APA", is available only to Verilink Access System 2000 circuit elements: NCC 2020s, TAC 2010s, TIU 2850s, DIU 2130s, and DIU 2140s.

This option allows you to download new architecture (personality or features) from Access Manager to one or more circuit elements in a node. APA is an acronym forVerilink's Advanced Programmable Architecture. This feature is available only to Level 4 users.

The procedure that follows takes up to 10 minutes to complete. Before you begin, verify the following:

- The download files for the desired Access System 2000 circuit elements have already been installed on the same hard disk drive directory as the Access Manager 2000 software. Typically, this directory is `C:\AM2000`.
- The node has been configured to enable downline loading. You can check this in the *Node Configuration* menu. The **`Enable Downline load Firmware`** option must be set to **Y**.

WARNING

During download, the circuit element reverts to its original firmware load before the new firmware load is completely downloaded. Furthermore, the circuit element is out of service for up to 6 seconds during download.

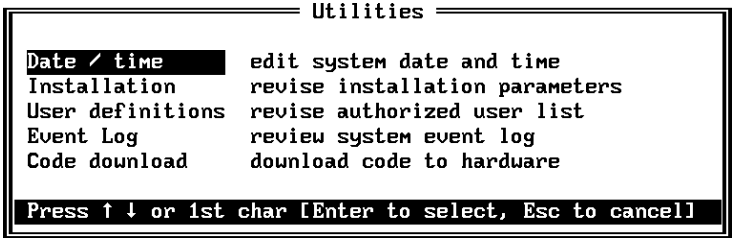
Therefore, downloading should be scheduled as an out-of-service period.

Since reverting to the original firmware load in the CSU executes the same operation as a power-up restart, the performance registers in the CSU will be reset.

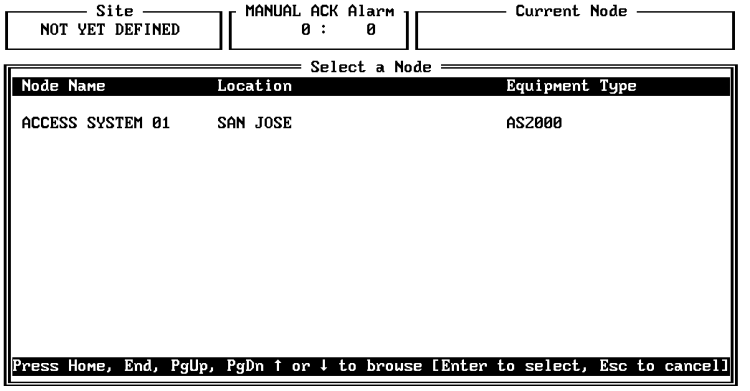
If you want to save the performance registers, you should reconfigure the AM2000 to perform scheduled polling before downloading of the CSU is started.

To download firmware code to the CSU:

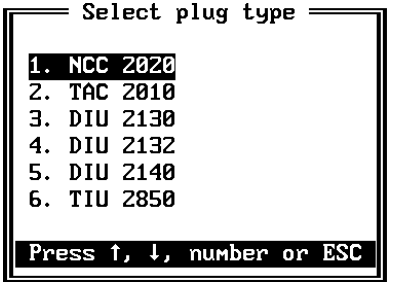
1. Go to the *Main Menu*, and select **`Utilities`**. The *Utilities Menu* will appear.



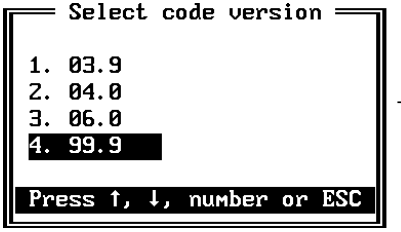
2. Select the **`Code download`** option. The *Select a Node* screen now appears. This screen lists all Acce ss System2000 nodes.



3. From this menu, select the node in which the target elements are located and press Enter . The *Select plug type* screen will appear.



4. Select the circuit element type from the *Select Plug Type* screen. The *Select Code Version* screen will appear.

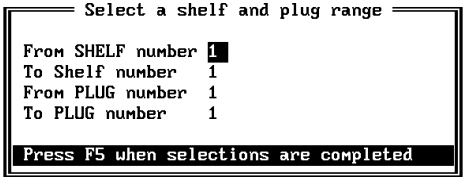


EXAMPLE ONLY.

This does not necessarily show true version numbers.

5. Select the version files to be downloaded to the CSU. Press Enter

The *Select a shelf and plug range screen* appears.


Select a shelf and plug range
From SHELF number 1
To Shelf number 1
From PLUG number 1
To PLUG number 1
Press F5 when selections are completed

Skip Steps 6 and 7 if the plug type is an NCC 2 0 20.

6. You can extend the range of shelves and plugs across different types of modules. Only modules of the type that you've selected will accept the download.

   Slots (and consequently, plugs) are numbered from left to right. The leftmost circuit element (that is, plug) in any shelf is always numbered 1. The second slot is 2, and so on.

   The shelf which includes the node controller is shelf number 1.

   If the plug is in a multiline shelf, you must enter the same shelf number you used when you set the *shelf address* during the initial hardware installation.

   Enter the shelf and range of slots in the fields.

   Press F5 to confirm the range.

7. If you enter an invalid shelf number or range of elements, an error message appears. Re-enter the proper numbers.

8. Once you confirm the range, a warning message appears to let you know that **once down-line loading begins, it cannot be aborted**.

   a. If you're sure you want to proceed with downline loading, type **Y** at the prompt.

   b. Otherwise, press any key to exit from this operation.

9. Access Manager now downloads the new firmware to the selected elements.

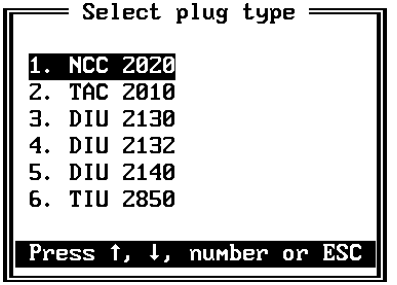
   - First, the circuit element reverts to its original firmware (whatever's in its EPROM) and its processor is reset. Once the processor is reset, circuit elements perform functions (including

self-test and clearing performance registers). During this activity, the CSUs are out of service for up to 3 seconds. Similarly, DIU circuit elements self-test and interrupt service to the data ports.

- After reset, the actual downloading begins. This can take up to 10 minutes, depending on the number of elements receiving the download. During download, the circuit element operates normally, running the original code in the EPROM.
- When the downloading is complete, the circuit element is reset again and out-of-service for up to 3 seconds. When service returns, the new code is installed and running.
- The downloading process has a self check at the end. Access Manager displays a message identifying which plugs were downloaded successfully and which, if any, failed:

```
Downloaded Successfully to plugs: 1 3 4 5
Downloaded Failed to plug: 2
Press any key to continue
```

After downloading is complete, the *Select Plug Type* screen reappears.



10. Press (ESC) then (F2) to return to the *Utilities Menu*.

    a. **If you want to verify the new firmware revision level**, go from the *Main Menu* into the *Online Menu* and use the **`Status element`** option.

    b. **If downline loading fails on any plug**, repeat the procedure on that plug.

    If the trouble continues, replace the circuit element in that slot and repeat the procedure on the new circuit element.

11. Your circuit element has now been updated and is ready for use.
12. This completes APA down-line loading.

Chapter

5

Configuring the T1 Network

This chapter gives you instructions for configuring the DS1 network elements with Access Manager. These operations are performed from the *Configuration* menu.

The tasks outlined in this chapter include:

- Configuring nodes (pag e5-10)
- Configuring circuit elements (pag e5-44)
- Configuring circuits (page 5-102)
- CSU acceptance testing (page 5-108)

Many operations and features are common to both AS2000 systems and 551VST type systems, but there are also some significant differences. When there is a difference, you will be presented with a menu that is customized for the difference.

Access System 2000 hardware is available in both dual-line and multiline shelving configurations, while ConnecT1 Plus hardware is only available in a dual-line configuration. The software specifications of the two products are, however, very similar. Because of this similarity, this chapter treats them as interchangeable.

T1 Network Monitoring Overview

Configuring the T1 network requires some basic familiarity with ***nodes***, ***circuit elements***, and ***circuits***.

Node

Physically, all nodes consist of at least one CSU and may contain additional elements such as DSUs and other CSUs.

Functionally, the node is the network management connection. It's often synonymous with the controller. It provides a point of access between Access Manager and the circuit elements it manages. As far as Access Manager is concerned, often the controller is the node.

A controller can take one of three physical forms. It can be:

- an integral physical part of a standalone CSU
- an integral physical part of a CSU element in a multiline shelf
- an electrically independent module in a multiline shelf

Standalone CSUs are also referred to as *single-line CSUs*.

Each controller has specific CSU circuit elements with which it can be used. A controller with its CSUs is referred to as a *parent node*. In Access Manager, the parent node's name is used to refer to the controller.

Table 5-1 Parent nodes and their components

Nodes composed of standalone CSUs are shown with the lightest shading. Nodes with independant controller modules are shown with darker shading. Nodes which use a controller integrated with a CSU on a multiline shelf are not shaded.

Parent Node Type	Controller	CSU Circuit Elements
551VST List 1/	551VST List 1/A	551VST List 1/A
551VST List 1/	551VST List 1/B	551VST List 1/B
551VST List 2	551VST List 2	551VST List 2
SIM	SIM	4016-R
NC/E	SIM	4016-R
551VST ML List 1	NMC List 1	4016 List (1 or 2)
551VST ML List 2	NMC List 2	4016 List (1 or 2)
AS2000	NCC 2020	NCC 2020 or TAC 2010
ConnecT1 Plus	CCC 1020	CCC 1020 or TAC 1010

Some of the more typical arrangements of shelves, nodes, and circuit element are shown in the following figures.

- Figure 5 -1, "SIM node"
- Figure 5 -2, "NC/E node"
- Figure 5 -3, "551 VST ML List 1 node"
- Figure 5 -4, "551VST ML List 2 node"

Figure 5-1 SIM node

The SIM node has one SIM controller and up to 10 4016-R CSUs.

Figure 5-2 NC/E node

The NC/E node includes up to 5551V MLS shelves. Each shelf has one SIM and up to 10 4016-R CSUs.

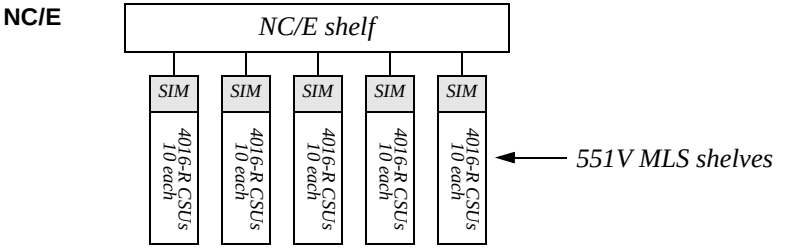


Figure 5-3 551 VST ML List 1 node

This is the CSU shelf configuration with an NMC List 1 Controller, or the NMC List2 Controller without NMC phase II firmware.

The 551VST ML List1 system has one 551VST MLB (Multiline Basic) shelf with or without the 551VST MLE (Multiline Expansion) shelf and contains up to 28 Model 4016 List 2 CSUs.

551VST ML List 1

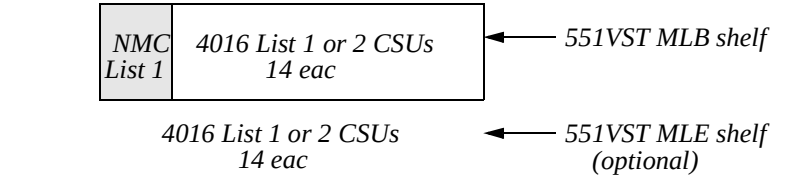
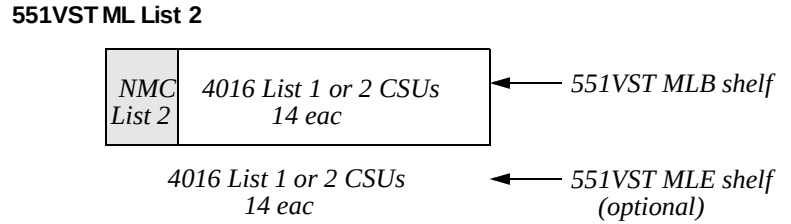


Figure 5-4 551VST ML List 2 node

The 551VST ML List 2 node includes the old List 1 or new List 2 shelf with a List 2 controller and Phase IINMC software to permit automatic alarm reporting.



A configuration of one or two stand-alone 551VST MLE expansion shelves at a location can also be configured as this type of node and should be configured for Data Link access (i.e., far-end) only.

Some rules of thumb

1. A **551VST List 2 with ASCII interface firmware** is installed as a *55 1VST List 1/B*.
2. A 551 VST MLE shelf, equipped with 4016 List 2 CSU modules and no controller, can only be used as a far end node.

Circuit element

A *circuit element* is a single module of the parent node to which Access Manager is connected.

Circuit

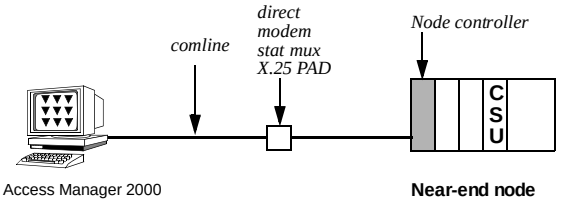
A *circuit* is the combination of any two network CSU circuit elements and their interconnecting DS1 facility, which have Access Manager access in a DS1 network. One endpoint would be a near-end CSU, and the other would be a far-end CSU.

Summary of tasks

To communicate withVerilink CSUs from the Access Man ager2000 software package, you must perform these basic sequenced steps:

1. Configure Access Manager's comline.

Menu used: **`Main`**/**`Utilities`**/**`Installation`**/**`Comlines`**

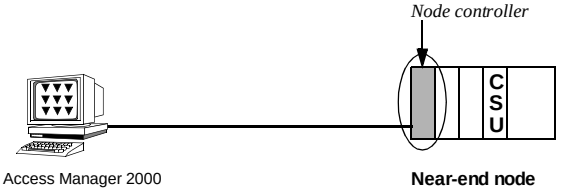


This determines how Access Manager and the node will communicate.

Depending on your equipment, you have up to four connection options: direct, modem, stat mux, and the X.25 PAD.

2. Configure the near-end node parameters.

Menu used: **`Main`**/**`Configuration`**/**`Node`**/**`Add`**



Functionally, a ***node*** is the point of access between the network manager and CSUs. Each CSU must have a *parent* node.

In a near end node, a *node controller* serves as the parent node for each CSU on its shelf (or shelves).

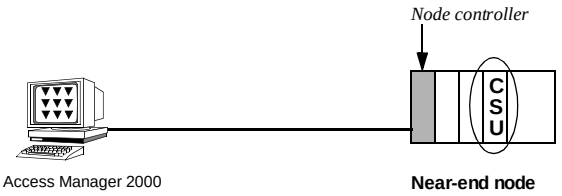
Configure all node parameters, except alarm reporting. Otherwise, you'll be interrupted by alarm messages incidentally caused by the configuration process.

When you save the node definition, the configuration is sent over the comline to the node controller.

- If a connection can't be made, you'll get an error message. Check for the fault.
- If a successful connection is made from Access Manager 2000 to the node controller, the *Element Configuration Menu* appears.

3. Configure the near-end CSU parameters.

Menu used: **`Main`**/**`Configuration`**/**`Element`**/**`Edit`**



If connected to a standalone CSU, configure the options for that CSU. If connected to a multiline controller, sequentially select and configure each CSU you'll use in that multiline shelf.

DIUs

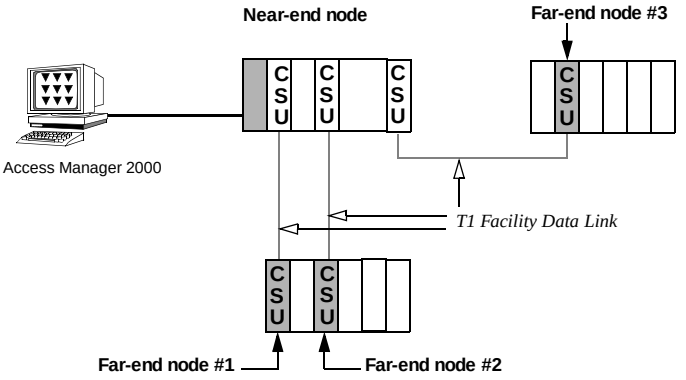
If you are using an Access System CSU with a DIU, configure your near end DIU parameters now.

4. Configure the far-end node parameters.

Menu used: **`Main`**/**`Configuration`**/**`Node`**/**`Add`**

Generally, each near-end CSU is paired, over the network, with a far-end CSU. Before you can configure a far-end CSU, you must define its node. Access Manager 2000 will communicate with the far-end node and CSU over the Facility Data Link.

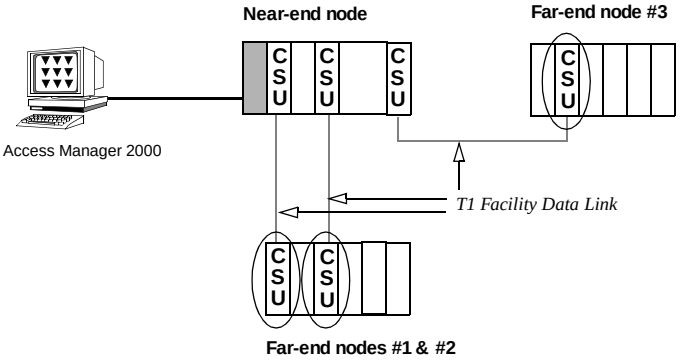
Operationally, each far-end CSU is managed as if it were a node as well as a circuit element. The node **`Query Path`** field must have **`NONE`** as its chosen option.



In summary, the far-end CSU is both defined as a node and configured as an element.

5. Build the database for the far-end CSU parameters.

Menu used: **`Main`**/**`Configuration`**/**`Element`**/**`Edit`**



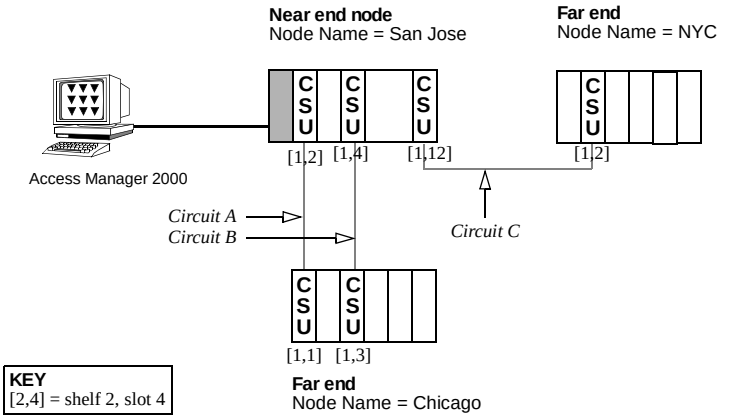
Select the configuration parameters for each far-end CSU you'll use, and use (F5) to attempt to download the configuration. A message will come up saying that you need to build a circuit first. Although your actual download was "unsuccessful", you did succeed in building a spot for the configuration in the database.

6. Configure a circuit between the CSUs.

Menu used: **Main**/**Configuration**/**Circuit**/**Add**

Once the far end is configured, you must configure a circuit between the near-end CSU and its far-end CSU. A circuit provides a path for all informational flow between the two CSUs. It defines how the CSU will talk to the node and, hence, to the network manager.

Add a circuit between the near end (**From DS1 point**) and the far end (**To DS1 point**).



For both of these options, you must enter the Node Name exactly as you first defined it, character for character. If you're dealing with multiline CSUs, you must also select a shelf number and slot number.

For Circuit A: From DS1 point = San Jose,1,2
To DS1 point = Chicago,1,1

For Circuit B: From DS1 point = San Jose,1,4
To DS1 point = Chicago,1,3

For Circuit C: From DS1 point = San Jose,1,12
To DS1 point = NYC,1,2

7. Download the far-end CSU configuration built in Step 5.

Menu used: **Main**/**Configuration**/**Element**/**Edit**

Now that you've built a circuit with the help of the database "place holder" you created in Step 5, return to the far-end CSU configuration screen and download the parameters you set.

DIUs

If you are using an Access System CSU with DIU, you need to configure your far end DIU parameters now. However, you cannot configure the far end DIU over the Facility Data Link. You **must** access the far-end DIU via its associated and co-located node controller.

8. **Enable alarm reporting for the nodes.**

   Menu used: **`Main`**/**`Configuration`**/**`Node`**/**`Edit`**

   Now, go back to each node you configured and enable the alarm reporting option.

9. **Verify your access to the nodes and elements.**

   Menu used: **`Main`**/**`On-line`**/**`Element Configuration Display`**

   Select the near-end node. Once connected, confirm that the Node Name appears in the upper right hand corner of the display screen, under the words **`Current Node`**. Repeat this process for the far-end node.

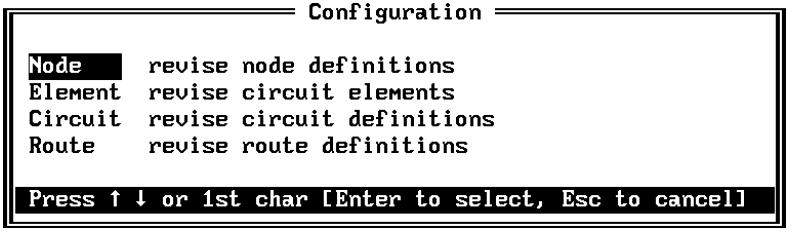
10. **The nodes are now part of your Access Manager 2000 database.**

    You can now go "on-line" to perform diagnostics, perform loopbacks, and query registers.

Configuration menu

All configuration of nodes, elements, and circuits is done from the *Configuration* menu, which is selected from the *Main Menu*.

Figure 5-1 Configuration Menu


Configuration
Node revise node definitions
Element revise circuit elements
Circuit revise circuit definitions
Route revise route definitions
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

Each type of configuration is described in the subsequent sections.

Configuring nodes

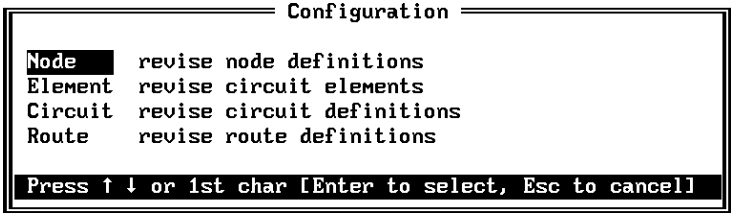
This section describes how to add, edit, delete, view, print, and list node definitions. The following subsections will show you how to arrive at the appropriate screens for the procedure you wish to execute. All of the fields within each screen are described in the order they appear (from top to bottom).

Getting to the Node Definition scree

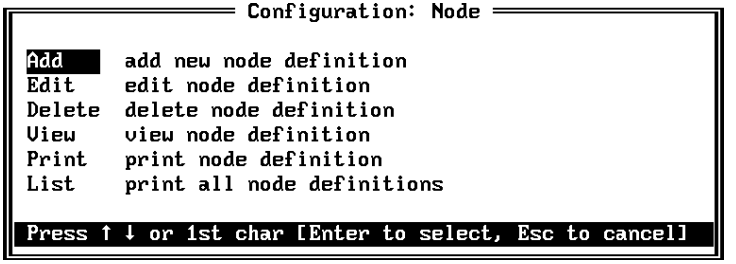
To do any node configuration, you must first get to the *Node Definition* screen.

To access the Node Definition screen:

1. From the *Main Menu*, select **Configuration**. This will take you to the *Configuration Menu*.


Configuration
Node revise node definitions
Element revise circuit elements
Circuit revise circuit definitions
Route revise route definitions
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

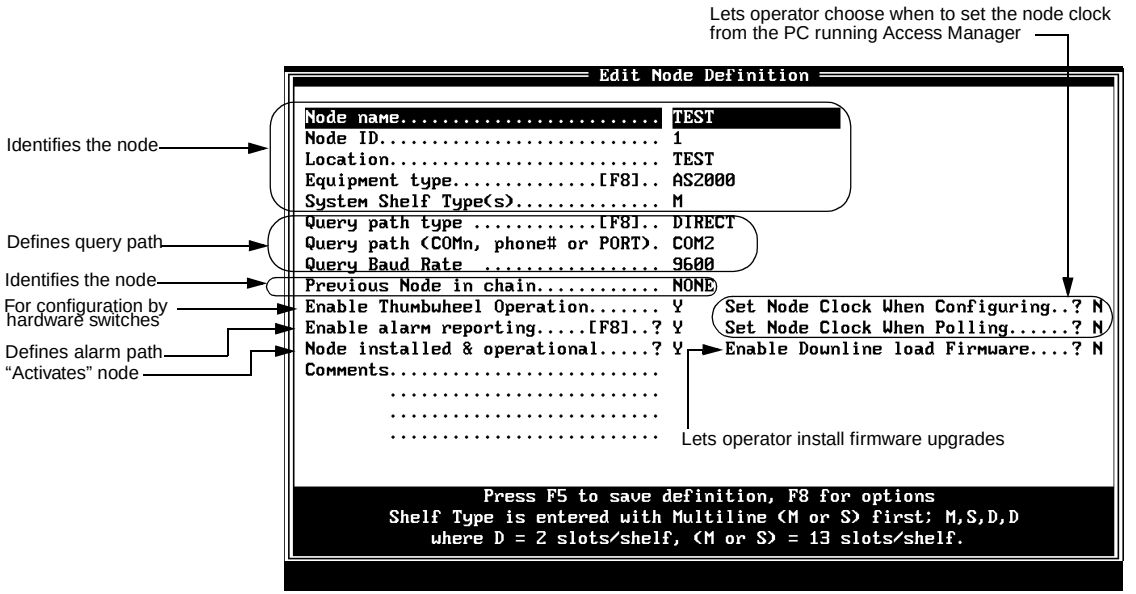
2. From the *Configuration Menu*, select **Node**. This will take you to the menu labeled **Co nfiguration:Node**.


Configuration: Node
Add add new node definition
Edit edit node definition
Delete delete node definition
View view node definition
Print print node definition
List print all node definitions
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

   a. If you are adding a node, select **Add**. This will take you directly to the *Add Node Definition* screen.

   b. If you are editing a node, select **Edit**. This will take you to a screen labeled **Se le ct NodetoEdit**. Use the ↑ or ↓ key to highlight the node you wish to edit, and press Enter.

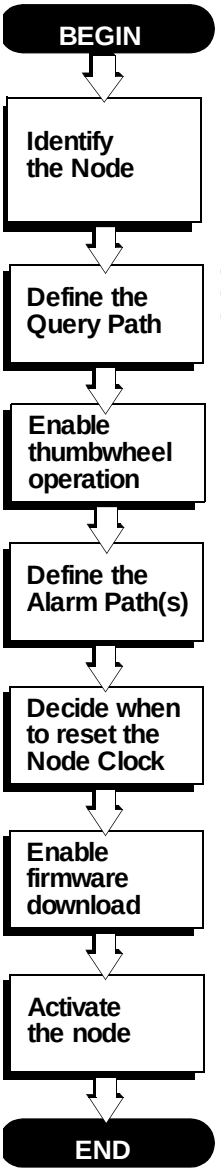
      This will take you to the *Edit Node Definition* screen.


Lets operator choose when to set the node clock from the PC running Access Manager
Edit Node Definition
Identifies the node
Defines query path
Identifies the node
For configuration by hardware switches
Defines alarm path
"Activates" node
Node name..... TEST
Node ID..... 1
Location..... TEST
Equipment type.....[F8].. AS2000
System Shelf Type(s)..... M
Query path type .....[F8].. DIRECT
Query path (COMn, phone# or PORT). COM2
Query Baud Rate 9600
Previous Node in chain..... NONE
Enable Thumbwheel Operation..... Y
Enable alarm reporting.....[F8]..? Y
Node installed & operational.....? Y
Comments.....
Set Node Clock When Configuring..? N
Set Node Clock When Polling.....? N
Enable Downline load Firmware....? N
Lets operator install firmware upgrades
Press F5 to save definition, F8 for options
Shelf Type is entered with Multiline (M or S) first; M,S,D,D
where D = 2 slots/shelf, (M or S) = 13 slots/shelf.

The contents of the *Add Node Definition* screen and the *Edit Node Definition* screen are identical. Therefore, we'll refer to them collectively as the *Node Definition* screen.

Summary of tasks

The following diagram shows you how what tasks are involved in configuring the node.



Node configuration option	How the option lets you complete your task:
Node Name Node ID Location Equipment Type System Shelf Type Previous Node in Chain	Lets you identify each node with a unique name and number. Identifies the equipment type, location, shelf arrangement, and node order in a daisy chain.
Query Path Type Query Path (COMn, phone# or PORT) Query Baud Rate	Lets you define the method Access Manager will use to open an informational path to the node.
Enable Thumbwheel Operation	Allows an operator to configure by using thumbwheel switches on the circuit elements.
Enable Alarm Reporting	Lets you define an alarm path from the node to Access Manager. For Access System equipment, you'll be able to define alternate alarm paths.
Set Node Clock When Configuring Set Node Clock When Polling	Lets you choose when to set the node clock from the PC running Access Manager.
Enable Downline Load Firmware	Lets you deny or allow an operator to use Access Manager to download firmware into circuit elements.
Node installed & operational	Lets you "activate" the node for operation in the network and with Access Manager.

Identifying the node

The following desired node definition values can now be entered.

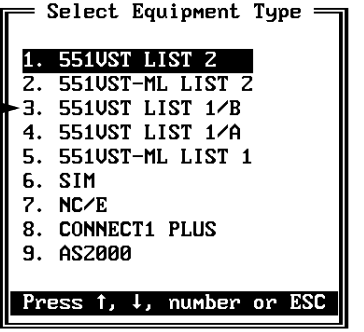
`Node Name` This uniquely identifies each node. This identifier is always unique and cannot be duplicated for use with other nodes. It can have up to 16 characters, including spaces or dashes.

`Node ID` This identification number can ***only*** be in the range from 1 to 65,535. Every time you add a new node, the node ID that appears is the next higher available number. You may keep that number or change it, but two nodes cannot share the same Node ID.

`Location` This identifies the node site---usually the location of a customer's equipment. This field can be up to 30 characters long. It is used to display nodes in alphabetical order, by location. Multiple nodes can have the same location.

`Equipment type` The default type is a 551 VST List 2 CSU. A list of the available options can be accessed by pressing F8.

Use this option for a 551VST List 2 with ASCII interface firmware.



The available equipment types are as follows:

`System Shelf Type(s)` With an AS2000 or ConnecT1 shelf, you must specify the type of shelf or shelves you're using. You must follow certain rules of syntax when entering this information. This information can be found in "Specifying shelf types for AS2000 nodes" on page 5 -15.

`Previous Node in chain` You can access up to three AS2000 or ConnecT1 Plus nodes through a single node connection. This access arrangement is called a ***daisy chain***.

Type NONE for this field if the nodes are daisy-chained and this is the first node. Also enter NONE if this is not a daisy-chained node.

If this is the second node in the daisy chain, enter the **Node Name** which you entered for the first node in the chain.

If this is third node in the daisy chain, enter the **Node Name** which you entered for the second node in the chain.

Specifying shelf types for AS2000 node

For an Access System 2000 node, specify the arrangement of the shelves accessed by this node. There are three types of shelves to choose from:

- **S** specifies the Multiline Shelf 2200 (MLS 2200)
  - 13 slots with redundant power supplies (A, B)
  - Split backplane (Bus A)
- **M** specifies the Multiline Shelf 2000 (MLS 2000)
  - 13 slots with redundant power supplies (A,B)
- **D** specifies the Dual-line Shelf 2000 (DLS 2000/1000)
  - 2 slots with redundant power supply inputs

More details about the bus arrangement of each of these shelves is available in the *Access System 2000 Overview Manual*.

You must follow certain syntax rules when specifiying AS2000 shelves.

Use a comma (,) when entering arrangements of multiple shelves. For example, if the AS2000 node is a multiline, dual-line combination, enter **M, D** for **Shelf Type**. The first shelf, in this case, **M**, is hardware addressed 1, and the second shelf, **D**, is hardware addressed **2**.

Dual-line shelves must always be the last shelf. For example, when you are entering an MLS 2200, MLS 2000, and two DLS 2000, the nodes could be entered one of two ways:

- **S,M,D,D**
- **M,S,D,D**

Table 5-2, "Allowable AS2000 shelf configurations," on page 5-16 shows several possible configurations of the AS2000 nodes.

Table 5-2 Allowable AS2000 shelf configurations

M	M, M	D	D, D	M, D	M, D, D	M, M, D	M, M, D, D
S	S, S	M, S	S, D	M, S, D	S, D, D	S, S, D	S, S, D, D

For a ConnecT1 Plus node, specify the arrangement of the shelves accessed by this node. The only possible arrangements are such that the number of **D**s is equal to the number of shelves being used. (For example, for the four-shelf maximum, the arrangement would be **D,D,D,D**.)

Query and alarm paths

The ***query path*** is used by Access Manager to query the node for status or other information or to download to the node. The ***alarm path*** is used by the node to report alarms to Access Manager.

Alarm Paths and Query Paths (and hence, their device types) are set from the *Node Definition* screen

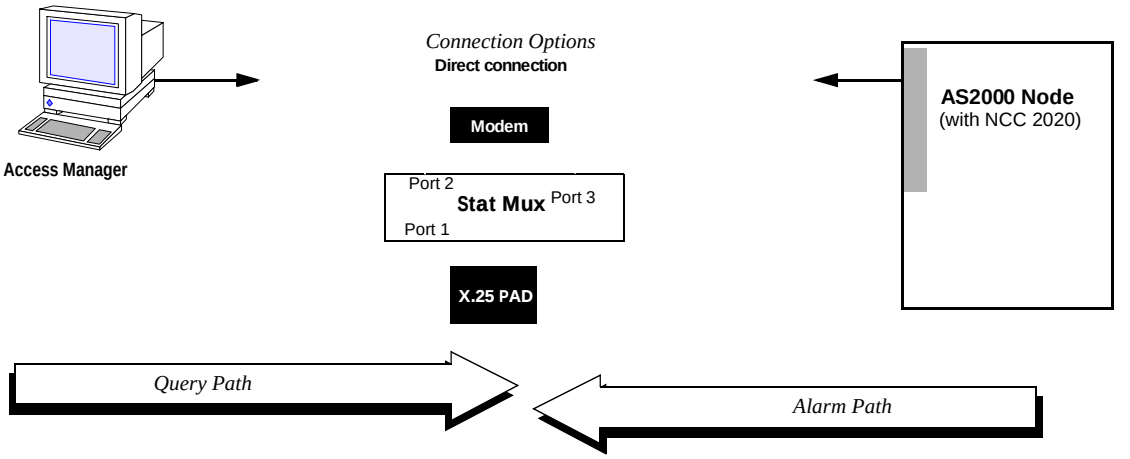
Before you can define these paths for the node, you must configure your comlines to support the node's access arrangement. The *access arrangement* specifies the type of connection at each serial port of the Access Manager PC.

Until now, if you wanted to set up an Alarm path or a Query path between Access Manager and your system node, you were limited to using either a direct connection, a modem, or a stat mux to connect.

If you're using either Access System 2000 or ConnecT1 Plus equipment with this new revision (Rev. 1.3) of Access Manager software, you also have the option of using an X.25 PAD (Packet Assembler Disassembler). This feature is not available with other Verilink ESF CSUs (for example, the 551 series).

The options you have for connecting the Access Manager PC to the node are summarized in Figure 5 -2, "How to connect the Access Manager PC and the node," on page 5 -17. An AS2000 node is shown because it's the only one which can use the X.25 PAD.

Figure 5-2 How to connect the Access Manager PC and the node

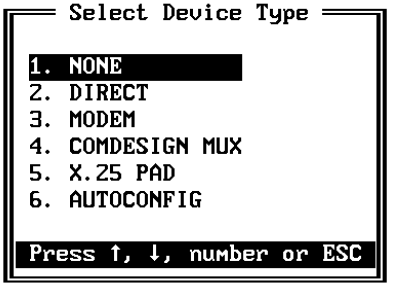


Defining query paths

To define the Query Path, you must, identify the device which transfers the query from Access Manager to the node, enter the destination address, and specify the baud rate used.

The fields which are used to do this are:

`Query path type` The following options are available:



`Query path (COMn, phone# or PORT)` This specifies the "address" of the connected device.

Before you configure the node, make sure you have configured your comlines to support the node's access arrangement. The comlines are configured in the Comline Definition screen of the Utilities Menu.

The query and alarm paths can be set according to the parameters in Table 5-3, "Assuring compatibility between Query Path and Comline settings". For each path option, you are asked to verify how you defined the corresponding comline in the *Utilities/Comline Definition/Access Arrangement* menu. This is designed to keep oversight from getting you into trouble:

Table 5-3 Assuring compatibility between Query Path and Comline settings

For this **Query path type:**	Enter the following for **Query path (COMn, phone# or PORT**	What you should have in the **Utilities/Comline Definition/Acces Arrangement** menu**.**
None		No comlines are used. These far-end elements are accessed through the ESF Facility Data Link.
	Use this if a node is second or third in a daisy chain (up to three are allowed).	
Direct	The comline used (for example, COM3).	DIRECT or AUTOCONFIG
Modem	Phone number	MODEM CALL/ANSWER, MODEM ANSWER ONLY, or AUTOCONFIG At least one comline must be connecte to a modem.
	If you wish to have a separate Query Path from the Alarm Path, then the comline reached by the Alarm Path phone number should be configured to **Access Arrangement = MODEM ANSWER ONLY**.	
ComDesign Mux	Port name assigned in the ComDesign RS2000 Multiplexer to the physical port where the node is connected. The Alarm Path is the port name assigned in the multiplexer to the physical port where Access Manager (that is, the PC collecting alarm reports) is connected.	COMDESIGNMUX, or AUTOCONFIG
X.25 PAD	Port name	X.25PAD
Autoconfig	COMn, phone #, or Port Name (Port Name assumes ComDesign mux).	AUTOCONFIG

If you have several PCs running Access Manager, you can configure a system so all the PCs can access the node, but only one receives the alarm reports.

To do this, the Node ID must be the same for all of the PCs. The PCs should access the node by modem or through a ComDesign statistical multiplexer. Since the PCs are at different phone numbers or ComDesign ports, the Alarm Path matches only the last PC that configured it. This PC is your designated alarm report PC. Alarm reports are only sent to this PC. Even when the node is accessed for its current status, it only sends the accumulated alarm reports if the alarm report PC accesses it. This allows multiple locations to access a node, but the alarms are reported only to a single master site.

The node checks the alarm path sent to it from the PC during the connection sequence. If this alarm path matches the one saved in the node, or if it is set to **NONE**, alarms are reported to the PC while it is connected. If the alarm path does not match, alarm reports are not sent. When Access Manager disconnects, the stored alarms are reported to the proper Access Manager site.

When the node's alarm path is set to **NONE**, alarms reports are accumulated until the node is accessed for its current status or configuration, at which point the alarm reports are sent and the buffer is emptied. Any PC accessing this node receives the alarm reports.

CAUTION

Regardless of how you last set the node's alarm path, if the accessing PC has in its database alarm path=NONE, you still ca receive and empty the node's alarm reports buffer.

Only the 551VST List 2, 551VSTML List 2, SIM, NC/E, and Access System 2000 nodes have the ability to perform automatic alarm reporting. All other node types should have the *Alarm Path* option set to NONE. The alarm path is the phone number, PC communication port, or multiplexer port for the alarm reporting port(s) connected to Access Manager. It is downloaded to the node and used to access Access Manager to report alarms.

Specifying baud rate

When defining a query path, you must specify the baud rate of the device which accesses the node. You can choose 1200, 2400, or 9600 baud. The default value is 9600 baud.

Specifics are given in Table 5-4, “Selecting baud rates by equipment type and access type”.

Table 5-4 Selecting baud rates by equipment type and access type

	Type of access			
Equipment type	**Direct**	**Modem**	**ComDesign Mux**	**X.25PAD**
• 551 VST List 2 • 551 VST ML List 2 • SIM • NC/E	9600	1200 o 2400	9600	Not applicable
Access System 2000	9600	9600	9600	9600
All other equipment	Can only be accessed at 1200 baud. For direct interface or 4-wire dedicated modem, set baud rate to either 1200 o 9600.			Not applicable

Note: *Newer revisions of the 551VST List 2, 551VST ML List 2, SIM, and NC/E can be accessed in dial-up mode using the Hayes® protocol at either 1200 or 2400 baud with an external modem. Existing revisions of the above products can be upgraded to this capability with a firmware change.*

Enabling alarm reporting

The **`Enable Alarm Reporting`** option tells a node that alarm messages should be sent to Access Manager either as they occur or when the node is accessed.

Only a node that has alarm reporting capability can have this option set to **YES** and then only if access to the node is through a direct connection, modem, or ComDesign multiplexer. Access System equipment is also compatible with the X.25 PAD (Packet Assembler Disassembler).

If access to the circuit elements in a node is through the ESF Facility Data Link, set this option to **`NO`**.

The following types of nodes can report alarms:

- 551VST List 2
- 551VST ML List 2 without ASCII interface firmware

- SIM
- NC/E
- Access System 2000

The node will auto-dial Access Manager and report status changes if ***both*** of these conditions are met:

a. the **`Enable Alarm Reporting`** option is set to **`YES`**, and

b. the **`Alarm Path`** option is set to anything other than **`NONE`** or **`DIREC`** .

For all of the latest revisions of the above listed multiline nodes (not the single-line 551VST List 2), if **`Alarm Path`** is set to **`NONE`** and **`Enable Status Change Reporting`** is **`YES`**, these circuit elements will report all accumulated uncleared alarms to Access Manager when they are contacted by Access Manager either during on-line access or scheduled polling.

Selecting options based on access arrangement

To continue configuring the node, you must view the following tables and select the appropriate data to enter into upcoming fields.

- Table 5-8, “Older CSU Circuit Elements BER Alarm Rest Times”
- Table 5-9, “Newer CSU Circuit Elements BER Alarm Reset Times”

Choose the table for your specific type of node.

Each column is an access arrangement type. Determine which column applies to the node you are adding. Enter the values in that column when you configure the node.

The access arrangement types listed in these tables are:

- **Direct:** The node’s network management port connects directly to a comline on the Access Manager host PC.
- **Modem:** The node’s network management port connects to a modem that receives calls from the Access Manager host PC and if enabled, calls Access Manager to report alarms.
- **None:** The node’s network management port is not used. Access to the node is limited to the Facility Data Link (which implies you’re dealing with a far-end node) or via daisy chain.

- **ComDesign:** The node's network management port connects to a statistical multiplexer.
- **X.25 PAD:** The node's network management port connects to an X.25 PAD (Packet Assembler Disassembler).

Table 5-5 Node configuration options for older equipment

This includes the for 551VST List 1, 551VST List 1/A, 551VST List 1/B, and 551VST ML List 1. These equipment types use TABS Protocol and do not support alarm reporting.

Access Arrangement (Connection) Option	Direct	Modem	None (Facility Data Link or Daisy Chain)	ComDesign
Baud Rate (Note 1)	1200	1200	1200	120
Query Path	COM 1-16	Phone No.	None	Port Name
Enable Alarm Reporting	No	No	No	No

NOTE 1. Currently, a modem (Comline) configured for 2400 baud cannot initiate calls to a node configured for 1200 baud. Configure the node in Access Manage for 2400 baud, and allow the modem to automatically downgrade to 1200 baud.

Table 5-6 Node Configuration Option for newer equipment

This includes the 551VST (ML) List 2, SIM, NC/E, ConnecT1 Plus, and AS2000. These equipment types use OSI protocol. The X.25PAD can only be used with AS2000 equipment.

Access Arrangement (Connection) Option	Direct	Modem	None (Facility Data Link or Daisy Chain)	ComDesign or X.25PAD
Report alarms:				
Baud Rate (Note 1)	9600	1200/2400	1200/9600	9600
Query Path	COM 1-16	Phone No.	None	Port Name
Alarm Path	COM 1-16	Phone No.	None	Access Manager Port Name
Previous Node in Chain (Note 2, 3	Node Name	None	None	None
Enable Alarm Reporting	Yes	Yes	No	Yes
Do not report alarms:				
Alarm Path	None	None	None	None

Access Arrangement (Connection) Option	Direct	Modem	None (Facility Data Link or Daisy Chain)	ComDesign or X.25PAD
Enable Alarm Reporting	No	No	No	No
Report alarms only when Access Manager contacts node:				
Alarm Path	None	None	None	None
Enable Alarm Reporting	Yes	Yes	No	Yes

NOTE 1. Currently, a modem (COMline) configured for 2400 baud cannot be used to originate calls to a nod configured for 1200 baud. Configure the node in Access Manager for 2400 baud, and allow the modem to automatically downgrade to 1200 baud.

NOTE 2. Modem and ComDesign are not available for the second and third AS2000 nodes in a daisy chain, although either of these access arrangements are available to the first AS2000 node.

NOTE 3. The **`Previous Node in Chain`** option is only available for AS2000 nodes.

Defining alternate alarm paths

Access Manager's new Alternate Alarm Path (AAP) feature is available for use with Access System 2000 products.

The alternate alarm path lets you establish separate alarm paths from one node to two different Access Managers. Consequently, you can

- simultaneously send each alarm to two Access Managers
- designate an auxiliary Access Manager to receive alarms when problems exist with the primary Access Manager

In addition, for each alarm path, you can specify the:

- number of times the node controller will try to send an alarm to Access Manager
- time interval between notification attempts
- length of time alarms are gathered before a notification attempt is made

Application scenarios

There are four ways to physically connect a PC running Access Manager to a node controller (located in an Access System 2000 node). You can connect directly with a cable, or you can use one of three com port access

devices (modem, stat mux, or X.25 PAD). Consequently, when an alarm is sent from the node controller to the Access Manager, it will travel along whichever of these connections you have installed. The alarm may be sent:

1. Directly from the node controller to the PC (via a NULL modem cable)
2. To a modem which will dial another modem connected to an Access Manager
3. To an X.25 PAD (Packet Assembler Disassember) which will contact another specified X.25 PAD attached to an Access Manager
4. To a stat mux for relay through an assigned port to another Access Manager

Direct connection allows you to set up only one dedicated path for the alarm.

However, because modems, X.25 PADs, and stat muxes are addressable com port access devices, any one of them may now be used to set up two alarm destinations.

The following diagrams show three typical scenarios set up for the new Alternate Alarm Path functionality.

- Figure 5 -3, "Application using modems"
- Figure 5 -4, "Application using a stat mux device"
- Figure 5 -5, "Application using X.25 PADs"

Figure 5-3 Application using modems

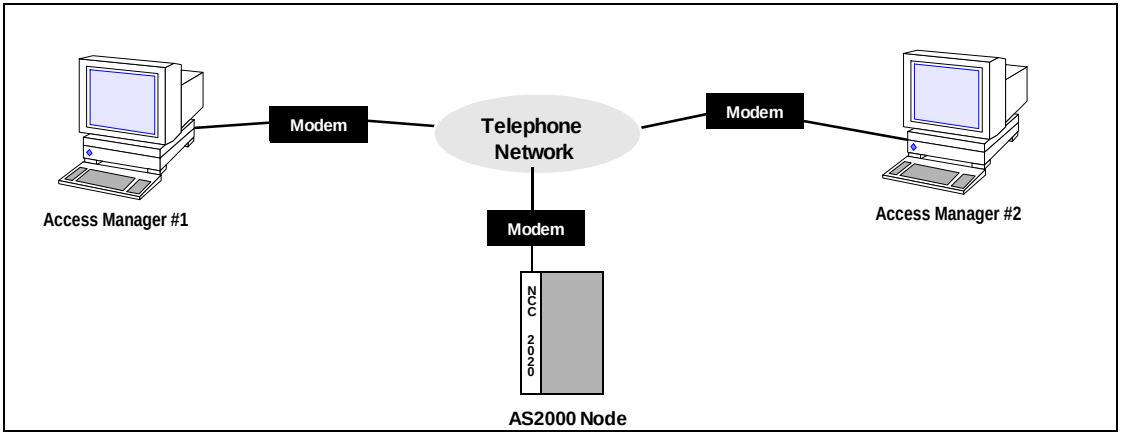


Figure 5-4 Application using a stat mux device

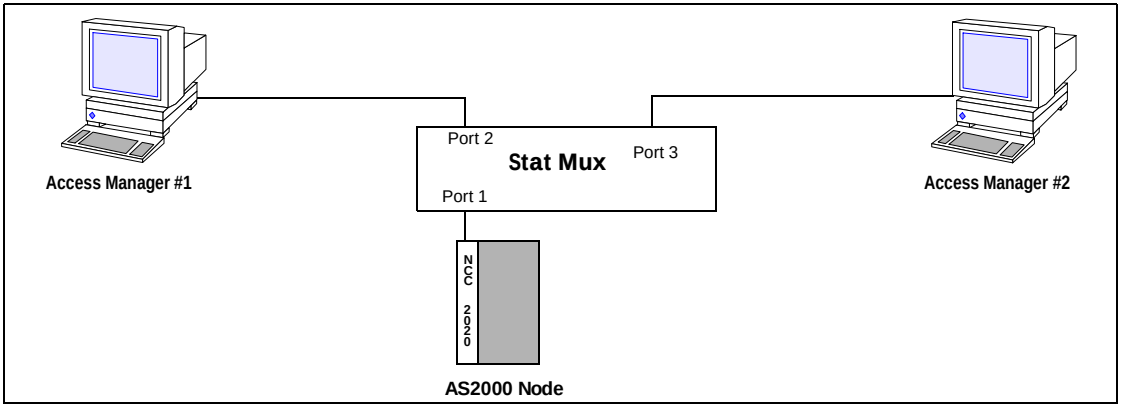
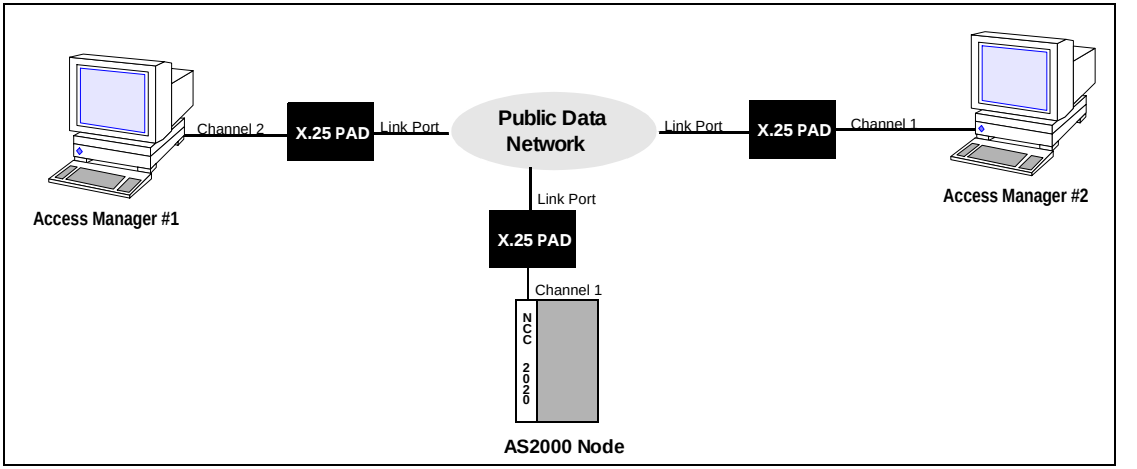


Figure 5-5 Application using X.25 PADs



What to do

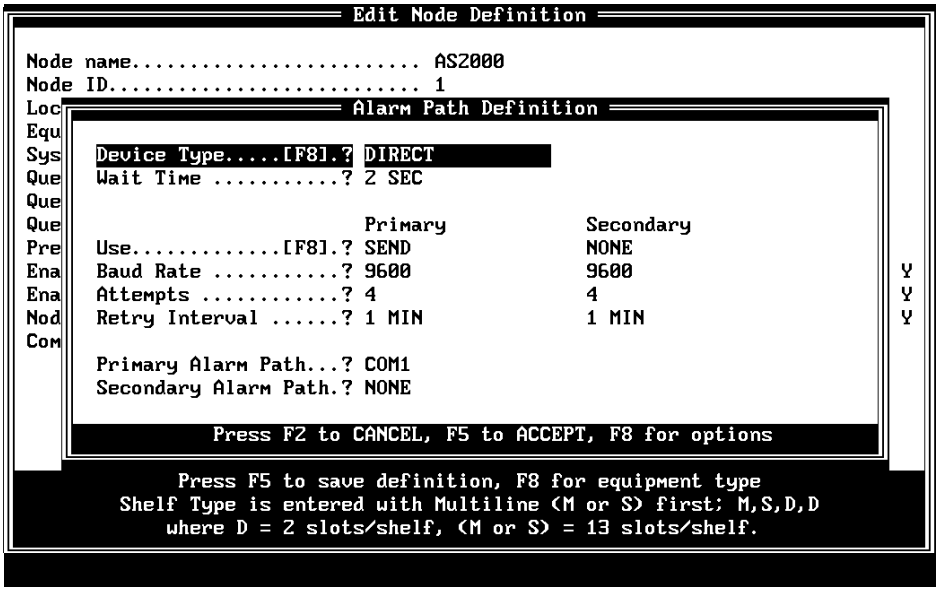
To set up your alarm paths, you'll need to:

- Identify each Access Manager (see "Differentiating the site" on page 4-3).
- Assign priority to an alarm path
- Set up alarm destination access
- Determine how long to collect alarms before sending
- Determine how often to try resending an alarm when a connection is not made

You can define the alarm path when you first add a node or whenever you edit a node. In either case, you need to access the new *Alarm Path Definition* screen for the alarm configuration parameters.

To access the Alarm Path Definition screen:

- In the *Node Definition* screen, go to the line labeled, **`Enable alarm reporting`**, and press F8.


Edit Node Definition
Node name..... AS2000
Node ID..... 1
Alarm Path Definition
Device Type.....[F8].? DIRECT
Wait Time .....? 2 SEC
Primary
Secondary
Use.....[F8].? SEND
NONE
Baud Rate .....? 9600
9600
Attempts .....? 4
4
Retry Interval .....? 1 MIN
1 MIN
Primary Alarm Path...? COM1
Secondary Alarm Path.? NONE
Press F2 to CANCEL, F5 to ACCEPT, F8 for options
Press F5 to save definition, F8 for equipment type
Shelf Type is entered with Multiline (M or S) first; M,S,D,D
where D = 2 slots/shelf, (M or S) = 13 slots/shelf.

A screen labeled **Alarm Path Definition** will appear as an overlay.

Now that you've reached this screen, you can begin to define your alarm path.

The left column lists the alarm path parameters. The middle and right columns are provided for defining separate alarm paths. Although the columns are labeled **Primary** and **Secondar** , the terms themselves do not designate a relative importance or sequence of alarm paths.

Assigning priority to an alarm path

When you set up two alarm paths, you can choose to use:

- Neither path, so no alarms are sent
- Only one of the paths
- The second path as a backup, if the first path cannot deliver the message
- Both paths simultaneously, so both Access Managers receive any alarm

The **Use** field is used to assign a relative priority to an alarm path. To view the available options, go to the **Use** field and press F8. A pop up menu will appear with these options:

SEND	The alarm will be reported to this alarm path.
BACKUP	The alarm will be sent to this path if the SEND path is unable to deliver the alarm.
NONE	Alarms are not to be sent to this path.

The acceptable combinations of options for this field are listed below:

Primary	Secondary	Description
SEND	SEND	Send to both addresses specified
SEND	BACKUP	Send to Secondary address only if Primary address is unavailable
BACKUP	SEND	Send to Primary address only if Secondary address is unavailable
SEND	NONE	Send only to the Primary address
NONE	SEND	Send only to the Secondary address
NONE	NONE	Do not send any alarms to either address

Based on the relative priorities you want to assign, enter your choices in the **Primary** and **Secondary** columns.

Setting up alarm destination access

To set up alternate alarm paths, you'll be using either a modem, a stat mux, or an X.25 PAD to communicate with Access Manager.

You need to specify the:

- type of device connected to the node controller
- speed at which the device operates
- address of the alarm destination

You must use the same com port access device and baud rate for both alarm paths.

To specify the com port access device:

1. Go to the **Device Type** field, and press F8. A pop up menu will appear listing the supporting devices:

Type of device	Definition
NONE	Either communication is provided through the ESF Facility Data Link or you are working with a daisy-chained node.
DIRECT	This is a direct connection to the Network Manager through a NULL modem cable. This option **cannot** be used for setting up alternate alarm paths.
MODEM	A modem that supports the Hayes command set.
X.25 PAD	An X.25 Packet Assembler Disassembler.
STAT MUX	A statistical multiplexer device.
AUTOCONFIG	Access Manager will select the device type. **This option will not work if you have a X.25 PAD.**

2. Use the up and down arrow keys to highlight the device type attached to the node controller, and press Enter.

   The pop up menu will disappear and the selected device type will appear in the field.

To select the device operating speed:

The only supported device operating speeds are baud rates of **1200**, **2400**, and **9600**.

- Modems are available and supported at all three operating speeds.
- Stat muxes and X.25 PADs generally operate at 9600 baud.

The field's default value is **9600**.

1. If you're using a direct connection, a stat mux, an X.25 PAD, or modems which operate at the same speed, go to the **Baud Rate** field and type in the speed at which the device will operate.

   When setting up alternate alarm paths, make sure you enter the same baud rate in the other alarm path column.

2. If you're using modems which operate at the different speeds, go to the **Baud Rate** field and type in the speed of the slowest modem in the particular alarm path you're configuring.

To name the alarm destination:

Each alarm destination must be designated by an address in the form of a contact number or string. A maximum of 40 characters are allowed, and the format of the string is dependent upon the device being used.

The supported devices use the following formats:

DIRECT	The address is a defined com port. Valid ranges are from COM1 to COM16. This option **cannot** be used for setting up alternate alarm paths.)
MODEM	The address is a valid AT dial string. If only digits are used, Access Manager presumes the address to be a phone number and defaults to using the ATDT (dial tone) command when connecting. For your ease, you may use parentheses and hyphens in the phone number. They won't confuse the modem.
X.25 PAD	The address is an ASCII string that corresponds to a vendor-specific connect command for the X.25 PAD being used. Complete addresses usually follow the format of a connect command followed by a device address.
STAT-MUX	This address is an ASCII string that corresponds to whatever name the port has been given in the stat mux device. For example, the port in the stat mux may have been named PORT1, CHANNEL2, or CHICAGO.

1. To specify the endpoint of the first alarm path, go to the **Primary Alarm Path** field and enter the appropriate contact number or string.

2. To specify the endpoint of the auxiliary alarm path, go to the **Secondary AlarmPath** field and enter the appropriate contact number or string.

Limiting alarm delivery attempts

You can choose the number of **Attempts** to deliver the alarm before giving up. If the path is specified as SEND and the number of retries expires, the alarm is sent to the BACKUP path.

The valid range is 0 to 255, with the default set to 10. Modems are limited to 1 to 15 attempts.

If a path's attempts are set at 0, then the alarm is sent as many times as necessar , until it's delivered. In other words, think of `0` as "no permission to give up". If the attempts are set to `4`, then only four attempts will be made to deliver the alarm along that path.

Pacing delivery of new alarms

To pace the delivery of new alarms, you can specify a **`Wait Time`**. The wait interval is defined, simply enough, as the amount of time to wait before sending new alarms.

When the first alarm is received, a timer is started with the time specified in this field. No alarms are sent to the Access Manager until the timer expires. This allows the node controller to collect (or "buffer") as many alarms as possible before establishing the connection to Access Manager to deliver alarms. If you're already accessing to the node controller, either through the *Configuration* or *On-Line Access* menus, the wait time will be ignored and you'll be sent the alarms as they come up.

This is especially useful when you're using a modem setup. It enables you to reduce the number of connections made (and telephone call charges incurred) when delivering single alarm messages.

To set the amount of time between attempts, go to the **`Wait Time`** field, and type in a time period in one of the following formats. The possible values include:

- 1 to 59 SEC
- 1 to 59 MIN
- 1 to 24 HR

The default value is `15 SEC` for each path.

Resending undelivered alarms

There are times when your alarm will not be delivered on the first attempt. For example, if you're using a modem, maybe the line was busy at the other end.

You can specify the time period before trying again if an alarm delivery was unsuccessful.

To set the amount of time between attempts, go to the **Retry Interval** field, and type in a time period in one of the following formats:

- 1 to 59 SEC
- 1 to 59 MIN
- 1 to 24 HR

If you forget to put a space between the number and the time unit, a space will be added automatically when you press F5 to accept the configuration parameters.

You can specify different retry intervals for each alarm path. The default value is 1 MIN for each path.

Access Manager will always attempt immediate delivery along an SEND alarm path. However, there are a few things to keep in mind:

- If both your alarm paths are designated SEND, the reality is that delivery is sequential. The node will alternate which Access Manager it tries to contact if both lines are busy. Also, in this case, the **Retry Interval** must be set to the same value.
- If your alarm paths are designated SEND and BACKU , respectively, the node will retry the SEND alarm path until the number of specified attempts is exhausted. Only then will it use the BACKUP alarm path.

Saving the alarm path parameters

Once you've set the parameters for each alarm path, press F5. This does some error checking to see if the parameters you've selected are acceptable to the system. If you've made a mistake, your screen will display an error message. Take the corrective action indicated, and try again.

Once this acceptance test is successful, you'll be returned to the uncovered *Node Definition* screen. At that point, press F5 to download the configuration to the database.

Error messages

If you've made an error in selecting your alarm path parameters, one of the following error message will appear on your screen.

Error Message	Cause	Corrective Action
`Invalid USE on Primary Path`	You selected a `Use` type other than `NONE`, `SEN`, or `BACKU`.	Go to the `Use` field and verify that each alarm path has a value of either `NONE`, `SEN`, or `BACKU`.
`Invalid USE on Secondary Path`		
`Invalid Device specified on Primary Path`	You selected a `Device Type` other than `DIREC`, `MODEM`, `STAT-MUX`, or `X.25 PA`.	Go to the `Device Type` field and verify that each alarm path has a value of either `DIREC`, `MODEM`, `STAT-MUX`, or `X.25 PA`.
`Invalid Device specified on Secondary Path`		
`At least one SEND path must be specified`	A `BACKUP` path has been selected with no existing `SEND` path.	If you want to use a backup path, go to the **`Use`** field and see which alarm path you've labeled `BACKU`. Change the other alarm path's **`Use`** field to `SEN`.
`Primary and Auxiliary device types must be the same`	Two different device types were selected.	Go to the `Device Type` field and verify that both alarm paths are either `MODEM`, `STAT-MUX`, or `X.25 PA`.
`Time format must be 1-59 SEC, 1-59 MIN, 1-24 HR`	• The `Retry Interval` is not in the proper format, or • The `Wait Interval` is not in the proper format.	Go to the `Retry Interval` and `Wait Interval` fields. Verify the following: • The time unit is abbreviated correctly. • The number is appropriate to the time unit. (For example, you haven't entered `27 HRS`.)
`BACKUP unreachable because SEND set for continuous`	A `BACKUP` path is specified while the `SEND` path set for continuous (attempts = 0). In other words, if the `SEND` path is set to 0, it never gives up, and a `BACKUP` path is irrelevant.	Either: • Set the `SEND` path for 1 to 256 attempts, or • Change the alarm path `Use` field from `BACKUP` to `NONE`.
`X.25 PAD supported only by AS2000 equipment`	User specified X.25 PAD for use with non-AS2000 equipment	Check you `Alarm path` and `Query Path` setups to see which of the following connections you're using: direct, modem, or stat mux. Then change the entry in the `Device Type` field to reflect that.

Error Message	Cause	Corrective Action
`Retry Interval must be the same if SEND/SEND specified`	Although you have specified `SEND` for both alarm paths, you have specified different `Retry Intervals`.	Make both `Retry Intervals` the same.
`Attempts must be limited to 15 or less when MODEM is selected`	The `Device Type` is `MODEM` and the `Attempts` are greater than 15.	For `Attempt` , select a value from 1 to 15.

Enabling thumbwheel operation

For each Access System 2000 or ConnecT1 plus node:

- To allow a local operator to use the thumbwheel switches on the master NCC 2020 or CCC 1020 for CSU access, configuration, and/or testing, select **YES** (default setting).
- To prevent unauthorized use of these switches, select **NO**. This setting disables the thumbwheel switches.

Resetting the node clock

Until this release of Access Manager, the node clock in the NCC2020 (and NCC 1020) would be set from the PC running Access Manager whenever:

- you configured a node
- Access Manager polled the node controller for performance data.

Now you can choose whether or not you want the clock set in either or both of these conditions.

This is especially helpful whenever two Access Managers, in different time zones, communicate with the same node. In such an instance, you'd probably want to give only one Access Manager the power to set the clock.

The two parameters which deal with this in the *Node Definition menu* are:

```
Set Node Clock When Configuring . . ? N

Set Node Clock When Polling . . . . ? N
```

Entering a **Y** will enable the feature. Entering an **N** will disable it.

Enabling firmware download

In AS2000 nodes, the **Enable Downline load Firmware?** option gives permission for an operator logged in with LEVEL4 access to download a new "personality"---or features---to the circuit elements in that node. The actual code download is executed from the *Utilities* menu.

- To allow code download to the circuit elements in that node, select **YES**.
- To prevent downloading to the node, select **NO** (default value).

Activating the node

After installing the node and verifying that it is ready to be connected to Access Manager, set the **Node Installed and Operational** option to **YES**. This option should only be set if three conditions have been satisfied:

1. The communication link to the node has been installed.
2. The node has been installed and tested locally.
3. The connection is known to operate properly.

If you set this option to **YES** when adding a node while Access Manager cannot successfully communicate with the node, an error message is generated and the installed option is reset to **NO**.

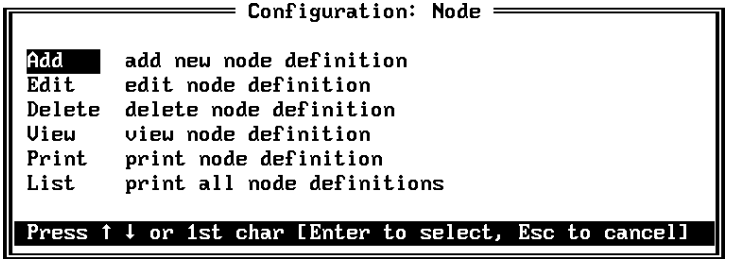
If you set this option to **YES** when editing a node and Access Manager cannot successfully connect to the node, this option stays set to **YES**.

Adding a node

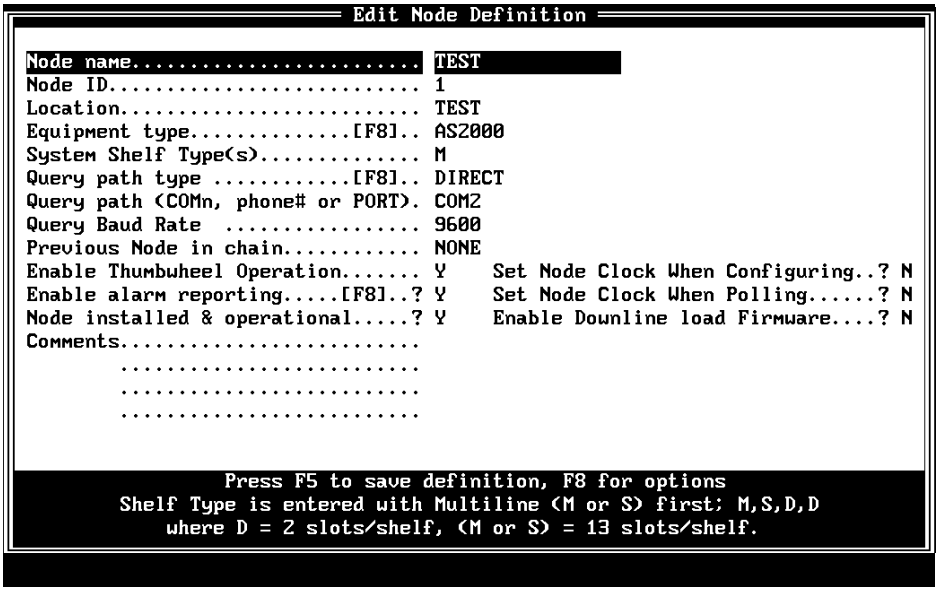
The first configuration item to be entered is the node definition.

To add a node definition:

1. From the *Configuration Menu* , select the **Node** option (type **N**). to revise node definitions. The *Configuration: Node* screen appears.


Configuration: Node
Add add new node definition
Edit edit node definition
Delete delete node definition
View view node definition
Print print node definition
List print all node definitions
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

2. Press the "A" key. The *Add Node Definition* screen appears.


Edit Node Definition
Node name..... TEST
Node ID..... 1
Location..... TEST
Equipment type.....[F8].. AS2000
System Shelf Type(s)..... M
Query path type .....[F8].. DIRECT
Query path (COMn, phone# or PORT). COM2
Query Baud Rate 9600
Previous Node in chain..... NONE
Enable Thumbwheel Operation..... Y Set Node Clock When Configuring..? N
Enable alarm reporting.....[F8]..? Y Set Node Clock When Polling.....? N
Node installed & operational.....? Y Enable Downline load Firmware....? N
Comments.....
Press F5 to save definition, F8 for options
Shelf Type is entered with Multiline (M or S) first; M,S,D,D
where D = 2 slots/shelf, (M or S) = 13 slots/shelf.

Comments

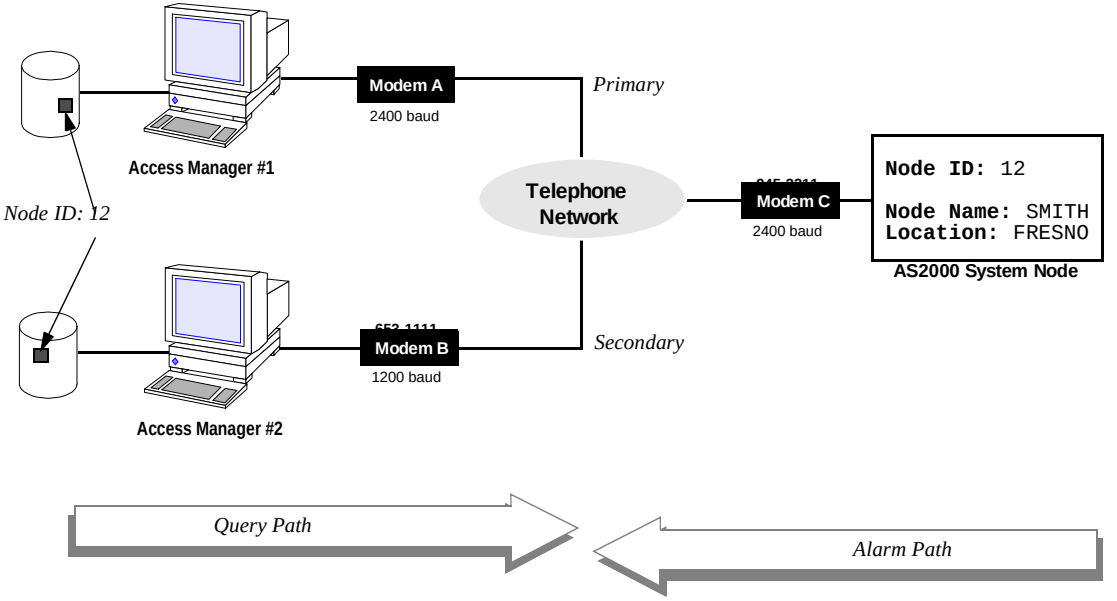
Four lines of comments leave room for you to enter information about the node. You can enter up to 120 characters, including spaces.

An ounce of prevention . . .

When you configure a node, you're actually creating access to a location in the database where an informational "picture" of the node is stored and can be modified. A **`Node ID`** provides a means of access to the database and a reference to the location within the database.

Every network manager which communicates with a given node must use the same **`Node ID`** for that node and have the same "picture" or representation of that node.

Figure 5-6 Access Manager's view of the node



As a consequence, review these pointers to avoid errors:

1. When using two Access Managers to manage the same node, enter the same node configuration data in the *Node Definition* screen at both Access Managers. Yes, this creates a redundant information base.

   The only deviation from this rule occurs when using modems operating at different baud rates. This is explained in #3.

2. When setting up alternate alarm paths to two different Access Managers, you must make the same entries for *Alarm Path*

Definition at each Access Manager. That way, each network manager knows under what conditions it will be receiving alarms from a node.

3. When using modems, always set the **Baud Rate** to the speed of the slowest modem in the path you're configuring.

   To clarify, let's refer to Figure 5 -6, "Access Manager's view of the node," on page 5 -37:

   - The baud rate for the Query path from **Modem A** to **Modem C** would be `2400`. This value is entered in the *Node Definition* screen at Access Manager #1.
   - The baud rate for the Query path from **Modem B** to **Modem C** would be `1200`. This value is entered in the *Node Definition* screen at Access Manager #2.
   - The baud rate for the Alarm path from **Modem C** to **Modem A** (*Primary Alarm Path*) would be `2400`. This value would be entered in the *Alarm Path Definition* screen at both Access Managers.
   - The baud rate for the Alarm path from **Modem C** to **Modem B** (*Secondary Alarm Path*) would be `1200`. This value would be entered in the *Alarm Path Definition* screen at both Access Managers.

4. The **Node Name** and **Location** fields are there to help the user (not the system) keep track.

   For example, *Access Manager #1* could have a **Node name** of `SMITH` for Node **12**, and *Acce ssManag er#2* could have a **Node name** of `JONES` for Node **12**.

   However, minimize user confusion by using identical terms or abbreviations across network managers.

Conclusion to Adding a Node

After you finish entering the required information for each node, press F5 to save the definitions. If insufficient or invalid information was entered, error messages tell you what to do in order to supply the correct information.

Node Access Failure

If Access Manager returns a **`NO CIRCUITS AVAILABLE`** message or an Access Manager **`FAILED TO ESTABLISH CONNECTION TO THE NODE`** message, try to access the node once more. Verify that the node is configured to be **`Installed and Operational`**.

If Access Manager still fails to access the node, refer to the following paragraphs.

Dial-Up Connection: If the node uses a dial-up connection, verify that the correct telephone number and Hayes® modem protocol (if required) have been entered in the query path of the node definition and that the node modem answers.

If the `NO CIRCUITS AVAILABLE` message appears, Access Manager could not find an available modem to access the node. Use the following steps to troubleshoot this error:

1. Verify that there is a Comline defined with the proper baud rate for that modem. If the node is equipped with a 1200 baud modem and you do not have a 1200 baud modem at the Access Manager site, then configure the node in Access Manager for 2400 baud and let the modems automatically downgrade when the connection is made.

2. If Access Manager fails to access the second or a successive node of a multiple-node Access System 2000 or ConnecT1 Plus system, the RS232 daisy chain from the first node to the desired node may be faulty. Try accessing a preceding (lower-numbered) node in this daisy chain. If the access to that node is successful, either the RS232 daisy chain is faulty and the originally requested node, or the NCC 2020 or CCC 1020 in the original node may be faulty.

3. If Access Manager still fails to access, repeat this step, going gradually back toward the first Access System 2000 or ConnecT1 Plus node until the access is successful. If the RS232 daisy-chain cabling is good, the master NCC 2020 or CCC 1020 may be faulty in one of the nodes.

4. If Access Manager cannot access any node, verify that the connected modem is properly configured, that the cabling is correct, and that the Comline is configured correctly. Refer to the appendices for cabling requirements, modem requirements, and Comline requirements. Verify that all the following are true:

- The modem is configured for Modem Call/Answer.
- The phone line is connected to the proper modem jack.
- The jack type is correctly configured in the modem.

Direct Connection: If a direct connection is used between Access Manager and the desired network node, verify that the connecting cable is wired correctly and that the proper COM port is defined in the *Configuration: Node* screen.

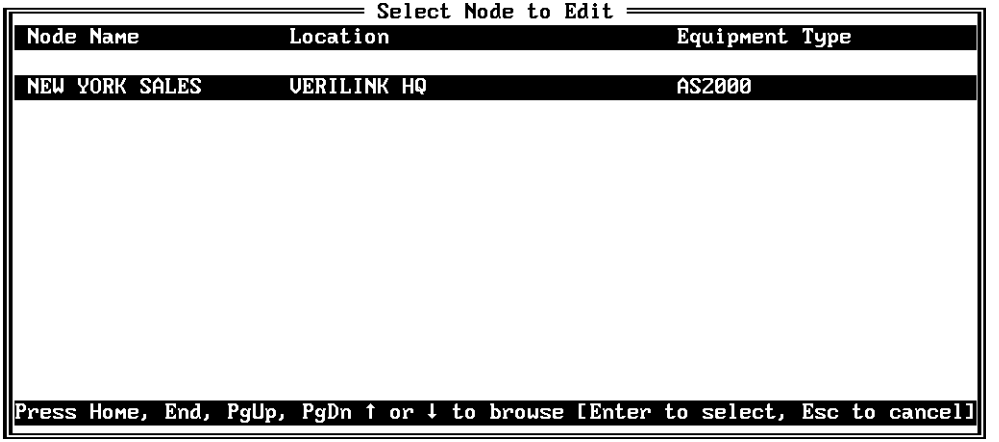
ComDesign Multiplexer Connection: If a ComDesign Multiplexer is used, verify that the Comline is set for access arrangement of ComDesign or automatic configuration. Also, verify that the access circuit between the near-end multiplexer and the multiplexer at the node is operational and that the multiplexer ports are configured correctly. It is important that you review your Comline configuration and installation.

Editing a node

A node definition can be edited any time after it has been added to the Access Manager database. The following steps show you how to edit a node:

1. From the *Main* Menu, type **C** to select the *Configuration Menu*.
2. Select the **Revise Node Definitions** option by typing **N**. The screen labeled *Configuration: Node* appears.
3. Type **E** to select the *Edit Node Definitions* screen. A *Select Node to Edit* screen similar to the one shown below now displays the first

eleven nodes in the Access Manager database in alphanumeric order.



4. Position the cursor at the node you wish to edit by using the Home, End, PgUp, PgDn, and/or the Arrow keys on the keypad. Press Enter to select that node. An *Edit Node Definition* menu no appears.

5. Make the required changes as described in the *Adding a Node* section above.

6. After making the changes, press F5 to accept them or F2 to abort editing.

   If the **Node Installed and Operational** option is set to **YES**, Access Manager immediately connects to the node and downloads the new data into it.

   If the connection is not successful, if the query path is **NONE**, or if **Node Installed and Operational** is **NO**, obviously the changes are not downloaded to the node; however, these changes are saved in Access Manager's database of the node's configuration for future downloading.

   If the **Node Installed and Operational** option was **YES** before editing and you did not change it, it remains **YES**. (See

the preceding section, *Node Access Failure*, if Access Manager indicates a failure to connect to the Node.)

7. After the database is updated, if these changes have not been downloaded to the node, the database configuration of the edited node is displayed. However, if these changes have been successfully downloaded, the *Element Configuration* screen appears. This menu sets the operating and reporting characteristics of the circuit element(s) of this node.

CAUTION

A change to a node name is not carried over into any circuit or route definitions using the node. For proper operation during database analysis, any change in a node name should also be made in the appropriate circuit or route definition(s).

8. To return to node definition editing, press F2. Access Manager now disconnects the node and returns to the *Select Node to Edit* screen.

Deleting a node

You can delete a node from the Access Manager database at any time.

Before deleting a node, remove any alarm path reporting telephone number that has been configured. Otherwise, the node, if physically installed, still attempts to call in alarms.

To delete a node from the system:

1. From the *Configuration Menu*, type **N** to select the **Node** option. The *Configuration: Node* screen now appears.

2. Type **D** to select **Delete Node Definition**. The *Select Node to Delete* screen now shows the Access Manager nodes in the same manner as the *Select Node to Edit* screen.

3. Use the direction keys to position the cursor at the node you want to delete.

4. Press Enter to select the node. You are now prompted to confirm that you want to delete the selected node.

5. Type **Y** to delete the node, or press any other key to abort the deletion.

Viewing a node definition

The view option of the *Configuration: Node* screen lets you look at the node's configuration without changing the current settings.

To view a node definition without changing it:

1. From the *Configuration: Node* screen, select the **View** option. The *Configuration* menu will appear.
2. From the *Configuration* Menu, select **Revise Node Definitions** by typing **N**. The *Configuration: Node* screen appears.
3. Type **V** to select the **View Node Definition** option. The *Select Node to View* screen displays the Access Manager nodes the same as in the *Select Node to Edit* screen.
4. Use the directional keys to position the cursor at the node you wish to view.
5. Press Enter to select that node. The detailed node definition now appears.

If you're using a color monitor, the text appears in red to show that no editing is allowed when in the viewing mode.

Printing a node definition

A single node and its circuit element definitions can be printed by using the **Print** option.

To print the nodes configuration settings:

1. From the *Configuration* Menu, select the **Node** option to go to the *Configuration: Node* screen.
2. Select the **Print Node Definitions** option by typing **P**. The *Select Node to Print* screen now shows the nodes in the same manner as the *Select Node to Edit* screen.
3. Use the directional keys to position the cursor at the node you wish to print.

4. Press the **Enter** key to select that node, and print the node and its associated circuit element definitions.

Listing all nodes

All defined nodes and their descriptions can be printed by using the **`List`** option.

- To select this option from the *Configuration: Node* screen, type **L**.

Configuring circuit elements

This section describes how to select, edit, delete, view, list, and configure network elements. The following subsections will show you how to arrive at the appropriate screens for the procedure you wish to execute. All the fields within each screen are described in the order they appear (from top to bottom).

The Configuration menus for circuit elements do not always display the type of circuit element you are accessing. When the node may access more than one type (such as 4016-L 1 and 4016-L 2 CSUs), this can be confusing. When the node is a 551VST ML List 1, both types of CSU circuit elements are referred to as NMC-L 1 CSU. Similarly, when the node is a 551VST ML List 2, both types of CSU circuit elements are referred to as NMC-L 2 CSU.

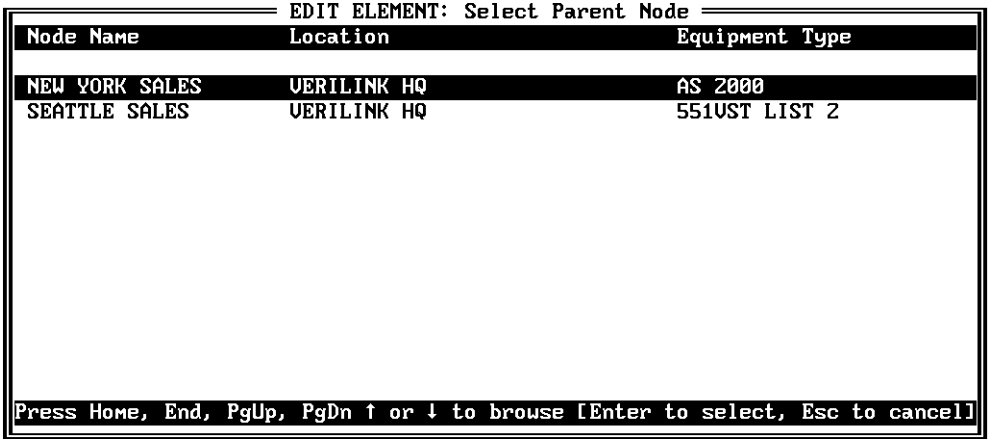
You must be logged in with LEVEL3 access or higher to change parameters in the *Edit Circuit Elements Options* screen. Access Level 2 allows you to change whether or not the near-end and far-end performance data are collected. Access Level 1 limits you to viewing and listing the circuit element configuration options.

Element Sub-menus

To reach the appropriate element configuration menu:

1. Starting from the *Main Menu*, select **`Configuration`**.

2. From the *Configuration Menu* , select **Element**. The *Edit Element: SelectParent Node* screen now appears.



If this menu has no nodes listed, then no nodes have yet been configured and you cannot access any elements to edit, view, list, etc. If this is the case, go back and configure the node, first.

3. If nodes are listed, select a parent node by moving the cursor to your choice and pressing (Enter). Depending on the type of node, one of the Configuration Actions menus appears:

Figure 5-7 Configuration: 551VST List 2 Menu

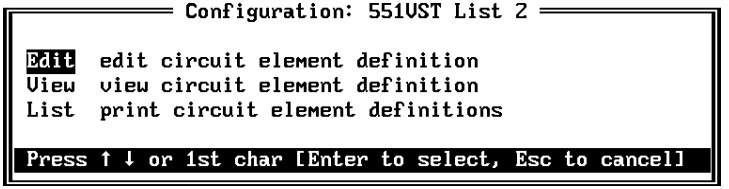

Configuration: 551VST List 2
Edit edit circuit element definition
View view circuit element definition
List print circuit element definitions
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

Figure 5-8 Configuration: 551VST-ML List 2 Menu

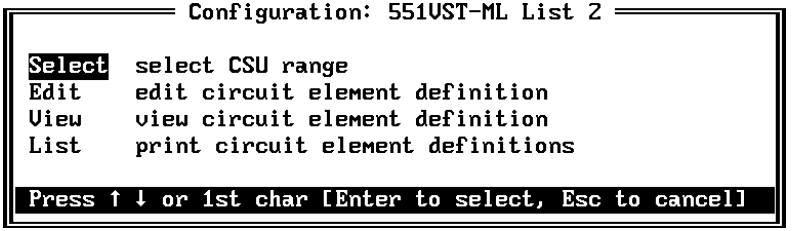
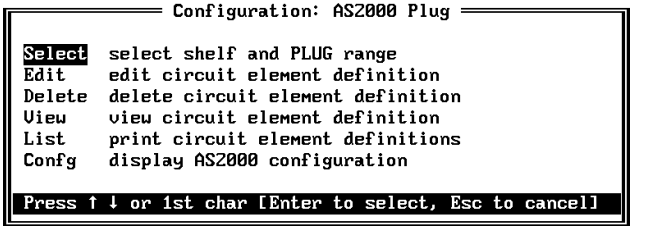

Configuration: 551VST-ML List 2
Select select CSU range
Edit edit circuit element definition
View view circuit element definition
List print circuit element definitions
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

Figure 5-9 Configuration: AS2000 Me


Configuration: AS2000 Plug
Select select shelf and PLUG range
Edit edit circuit element definition
Delete delete circuit element definition
View view circuit element definition
List print circuit element definitions
Confg display AS2000 configuration
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

This is the first step in selecting the circuit element(s) to be configured. It tells Access Manager who is the circuit element's parent node (i.e., its node name). The parent node's name appears in the Current Node block in the upper right portion of the screen. The node type appears in the menu title.

If the parent node is a multiline type, the circuit element is selected by node name [shelf, slot].

If the parent node is a single element type, the circuit element is selected by node name only. If you are accessing a multiline circuit element continue in the *Selecting a Circuit Element Range* section that follows.

Because every CSU (or DSU) has a default value, there is no **Add** option in the Configuration Actions Menus. To add a circuit element, select the **Edit** option and choose a parent node; then use Ctrl PgUp and Ctrl PgDn to choose the plug number which will hold the new circuit element.

Far-End Circuit Elements

Access Manager supports configuration of CSU circuit elements, whether far-end or near-end. Far-end CSU circuit elements are accessed through the ESF Data Link. For this capability to function, follow these steps:

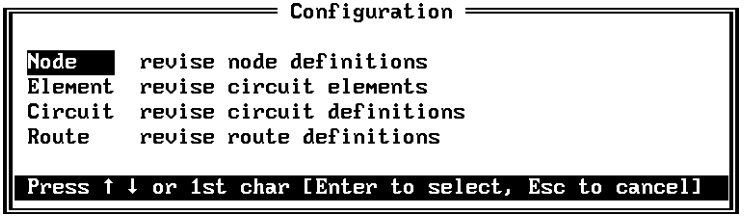
1. The parent node of the near-end circuit element must be installed and operational.
2. A direct or dial-up connection to the host PC must be in place for the near-end node. (DIU circuit elements can be configured if, and only if, the parent node is near-end.)
3. The near-end circuit element must be installed and operational.
4. The parent node of the (far-end) circuit element must be installed and operational.
5. The far-end circuit element must be defined in the database.
6. A circuit must be defined between a near-end circuit element and the far-end circuit element to be configured.
7. The far-end circuit element may now actually be accessed.

The *Configuration: AS2000 Plug* screen has the same selections as the *Configuration: ConnecT1 Plus Plug* screen.

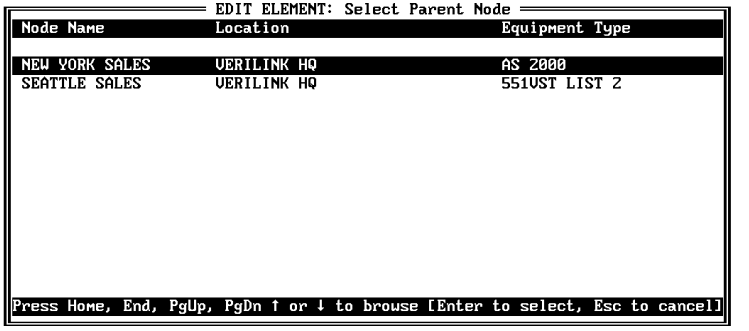
Select the circuit element range

To select the range of circuit elements:

1. Starting from the *Main* Menu, select **`Configuration`**. The *Configuration* Menu appears.


Configuration
Node revise node definitions
Element revise circuit elements
Circuit revise circuit definitions
Route revise route definitions
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

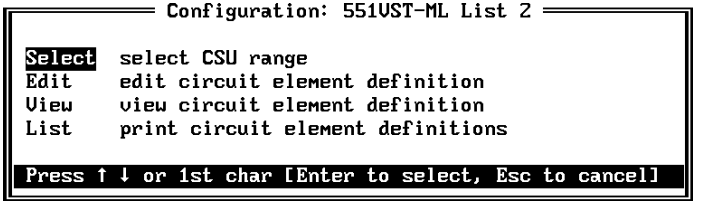
2. From this screen, select **Element**. The screen labeled *Edit Element: SelectParent Node* now appears.



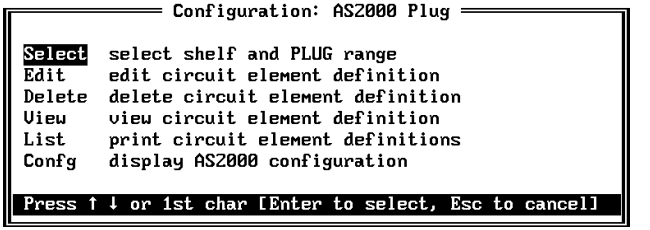
If this menu has no nodes listed, it means that no nodes have been configured yet.

3. Select the circuit elements' parent node. The menu that appears depends on the type of node. The menus are:

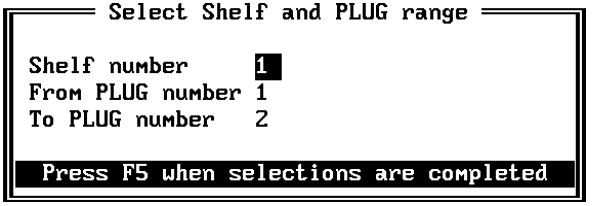
- **551VST-ML List 2**


Configuration: 551VST-ML List 2
Select select CSU range
Edit edit circuit element definition
View view circuit element definition
List print circuit element definitions
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

- **Access System 2000**


Configuration: AS2000 Plug
Select select shelf and PLUG range
Edit edit circuit element definition
Delete delete circuit element definition
View view circuit element definition
List print circuit element definitions
Confg display AS2000 configuration
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

4. Choose the **Select** option. The *Select xxx Range* data entry screen appears, where *xxx* indicates the type of parent node. This is a typical CSU range selection menu.



5. One or more CSUs or plugs in a shelf may be selected. If more than one is selected, Ctrl PgUp and Ctrl PgDn allow access to each of the circuit elements.

   The ranges selected for each multiline node are stored in the database and are used as the default range the next time you configure the circuit elements in that node.

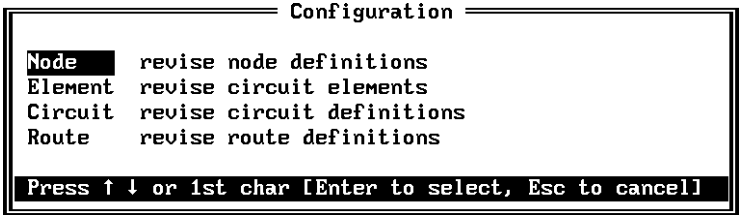
   Enter the shelf number and the slot (i.e., CSU or plug) range designating the circuit element(s) as follows:

Type of parent node	Conditions
551VST ML List 1 551VST ML List 2	The possible CSU (i.e., slot range) is 1 to 28. The shelf number is always 1 and is not entered.
SIM-equipped 551V MLS	The possible CSU (i.e., slot range) is 1 to 10. The shelf number is always 1 and is not entered.
NC/E node	The possible CSU (i.e., slot) range is from 1 to 10. This type of node also has a SIM shelf selection entry. The shelf number can be from 1 to 5.
Access System 200 node	The shelf number ranges from 1 to 4, corresponding to its hardware address. The plug (i.e.,slot) number ranges are: • from 1 to 13, if the shelf is a Multiline typ • from 1 to 2, if the shelf is a Dual-line type
ConnecT1 Plus node	The shelf number ranges from 1 to 4 and the plug number also ranges from 1 to 2.

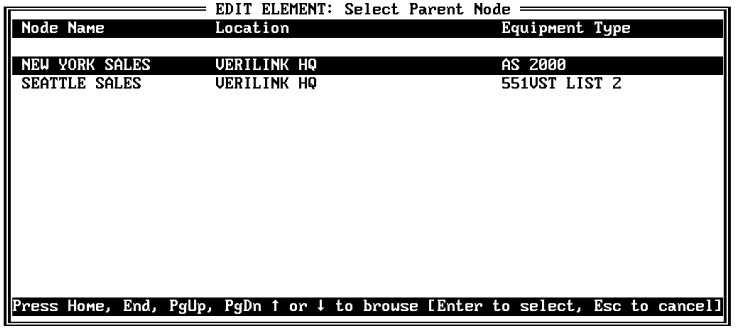
Editing circuit element definitions

To edit a circuit element's definition:

1. Starting from the *Main Menu*, select **Configuration**. The screen labeled *Configuration* appears.


Configuration
Node revise node definitions
Element revise circuit elements
Circuit revise circuit definitions
Route revise route definitions
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

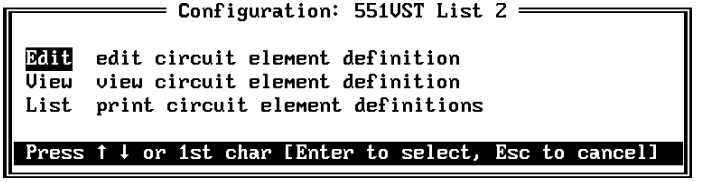
2. From this screen, select **Element**. The screen labeled *Edit Element: SelectParent Node* now appears.


EDIT ELEMENT: Select Parent Node
Node Name Location Equipment Type
NEW YORK SALES VERILINK HQ AS 2000
SEATTLE SALES VERILINK HQ 551VST LIST 2
Press Home, End, PgUp, PgDn ↑ or ↓ to browse [Enter to select, Esc to cancel]

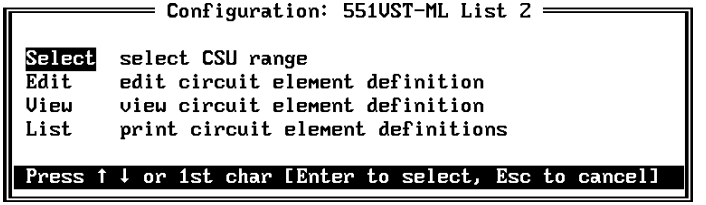
   If this menu has no nodes listed, it means that no nodes have been configured yet.

3. Select the circuit elements' parent node. The menu that appears depends on the type of node. The screens are shown as follows:

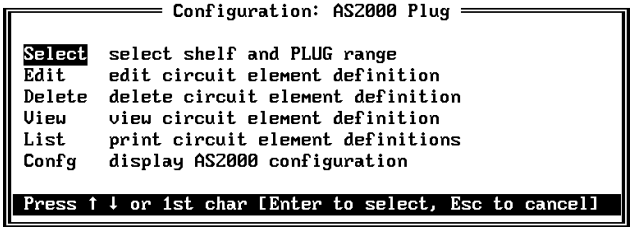
   - **551VST List 2**


Configuration: 551VST List 2
Edit edit circuit element definition
View view circuit element definition
List print circuit element definitions
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

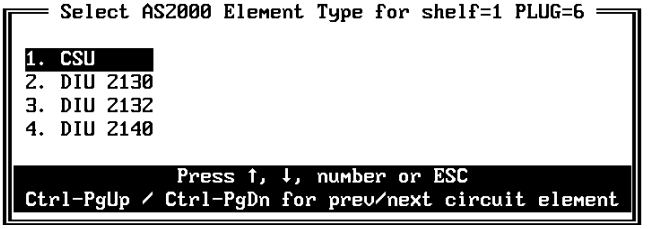
- **551VST-ML List 2**


Configuration: 551VST-ML List 2
Select select CSU range
Edit edit circuit element definition
View view circuit element definition
List print circuit element definitions
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

- **Access System 2000**

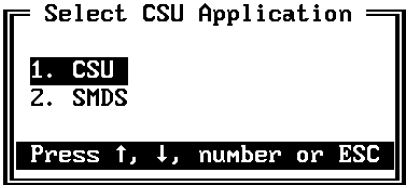

Configuration: AS2000 Plug
Select select shelf and PLUG range
Edit edit circuit element definition
Delete delete circuit element definition
View view circuit element definition
List print circuit element definitions
Confg display AS2000 configuration
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

4. If the parent node is an AS2000 type and the circuit element has not yet been configured or deleted, then the screen labeled *Select AS2000 Element Type* appears.


Select AS2000 Element Type for shelf=1 PLUG=6
1. CSU
2. DIU 2130
3. DIU 2132
4. DIU 2140
Press ↑, ↓, number or ESC
Ctrl-PgUp / Ctrl-PgDn for prev/next circuit element

If this is the case, choose a circuit element type from the list of options.

If you choose CSU, the *Select CSU Application* screen will appear:



Select **CSU**.

Note: *SMDS CSU capability is discussed in the Access System 2000 SMDS User Manual, PN 896-502018-001-1. Release is targeted for mid-1993..*

5. If the parent node is *not* an AS2000 type, then one of the following screens will appear:

   - **551VST List 1/A CSU**

```
Edit Options for 551VST LIST 1/A

*Installed and operational.....? N
   Retrieve performance data.....? Y
   Retrieve far end performance data..? N

* Disabling this option also disables the indented options below it.
                Press F5 to update circuit element
```

   - **551 VST List 1/B CSU**

```
Edit Options for 551VST LIST 1/B CSU

*Installed and operational......? N      Enable span side B8ZS encode? N
   Retrieve performance data....? Y      Enable span side B8ZS decode? N
   Retrieve far end data........? N      Regenerate CRC to span side.? Y
 *Enable remote configuration...? N      Span side ESF framing.......? Y
   10E-? BER threshold (0,4...9). 6      Enable EQP side B8ZS encode.? N
   Repeater loop timeout (secs).. 300    Enable EQP side B8ZS decode.? N
   Enable far end polling.......? N      Regenerate CRC to EQP side..? N
   Enable transparent mode......? N      EQP side ESF framing........? N
   Use FCC part 68 rule only....? Y
   AIS(not SIGNAL) loop-back....? Y
   AIS(not ESS) keep-alive......? Y
   Enable alarm latch...........? N

  * Disabling this option also disables the indented options below it.
                Press F5 to update circuit element
```

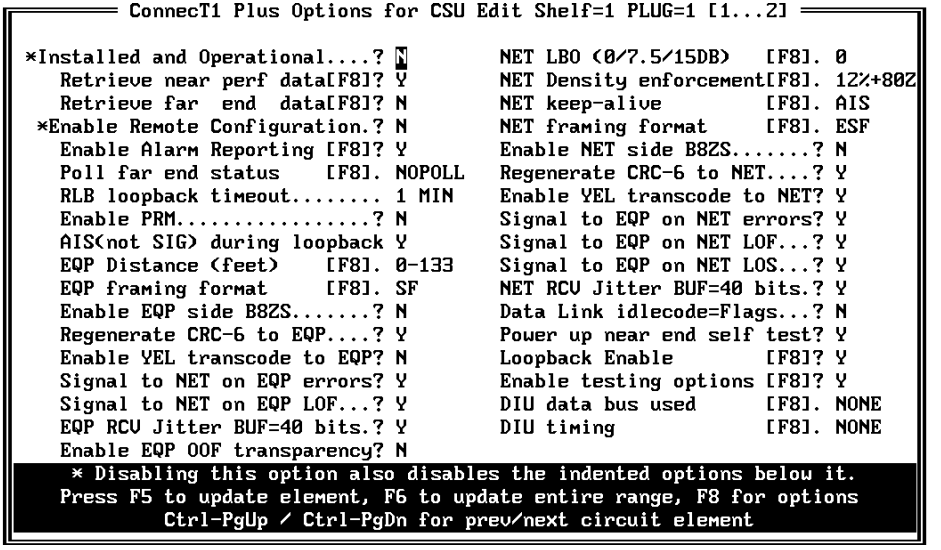
- **551VST List 2 CSU**

```
Edit Options for 551VST LIST 2 CSU

*Installed and operational......? N      Enable span side B8ZS encode? N
   Retrieve performance data....? Y      Enable span side B8ZS decode? N
   Retrieve far end data........? N      Regenerate CRC to span side.? Y
   Enable alarm reporting.......? Y      Span side ESF framing.......? Y
 *Enable remote configuration...? N     +Enable YEL transcode to span? N
   10E-? BER threshold (0,4...9). 6      Enable EQP side B8ZS encode.? N
   Repeater loop timeout (secs).. 300    Enable EQP side B8ZS decode.? N
   Enable far end polling.......? N      Regenerate CRC to EQP side..? N
   Enable transparent mode......? N      EQP side ESF framing........? N
   Use FCC part 68 rule only....? Y     +Enable YEL transcode to EQP.? N
   AIS(not SIGNAL) loop-back....? Y     +Idle code flags.............? N
   AIS(not ESS) keep-alive......? Y
   Enable alarm latch ..........? N
   Enable PRM...................? N

  * Disabling this option also disables the indented options below it.
            + These options may not be available on all CSUs.
```

- **NMC L1 with 4016 L2 CSU:**

```
Edit Options for NMC/L2 CSU #1 [1...28]

*Installed and operational......? N      Enable span side B8ZS encode? N
   Retrieve performance data....? Y     +Enable span side B8ZS decode? N
   Retrieve far end data........? N      Regenerate CRC to span side.? Y
   Enable alarm reporting.......? Y     +Span side ESF framing.......? Y
 *Enable remote configuration...? N     +Enable YEL transcode to span? N
   10E-? BER threshold (0,4...9). 6      Enable EQP side B8ZS encode.? N
 + Repeater loop timeout (secs).. 300   +Enable EQP side B8ZS decode.? N
   Enable far end polling.......? N      Regenerate CRC to EQP side..? N
   Enable transparent mode......? N      EQP side ESF framing........? N
   Use FCC part 68 rule only....? Y     +Enable YEL transcode to EQP.? N
 + AIS(not SIGNAL) loop-back....? Y     +Idle code flags.............? N
 + AIS(not ESS) keep-alive......? Y
 + Enable PRM...................? N

  * Disabling this option also disables the indented options below it.
            + These options are not available on L1 CSU.
     Press F5 to update circuit element or F6 to update entire range
```

- **ConnecT1 Plus CSU**


ConnecT1 Plus Options for CSU Edit Shelf=1 PLUG=1 [1...2]
*Installed and Operational....? N
Retrieve near perf data[F8]? Y
Retrieve far end data[F8]? N
*Enable Remote Configuration.? N
Enable Alarm Reporting [F8]? Y
Poll far end status [F8]. NOPOLL
RLB loopback timeout..... 1 MIN
Enable PRM.....? N
AIS(not SIG) during loopback Y
EQP Distance (feet) [F8]. 0-133
EQP framing format [F8]. SF
Enable EQP side B8ZS.....? N
Regenerate CRC-6 to EQP....? Y
Enable YEL transcode to EQP? N
Signal to NET on EQP errors? Y
Signal to NET on EQP LOF...? Y
EQP RCV Jitter BUF=40 bits.? Y
Enable EQP OOF transparency? N
NET LBO (0/7.5/15DB) [F8]. 0
NET Density enforcement[F8]. 12%+80Z
NET keep-alive [F8]. AIS
NET framing format [F8]. ESF
Enable NET side B8ZS.....? N
Regenerate CRC-6 to NET....? Y
Enable YEL transcode to NET? Y
Signal to EQP on NET errors? Y
Signal to EQP on NET LOF...? Y
Signal to EQP on NET LOS...? Y
NET RCV Jitter BUF=40 bits.? Y
Data Link idlecode=Flags...? N
Power up near end self test? Y
Loopback Enable [F8]? Y
Enable testing options [F8]? Y
DIU data bus used [F8]. NONE
DIU timing [F8]. NONE
* Disabling this option also disables the indented options below it.
Press F5 to update element, F6 to update entire range, F8 for options
Ctrl-PgUp / Ctrl-PgDn for prev/next circuit element

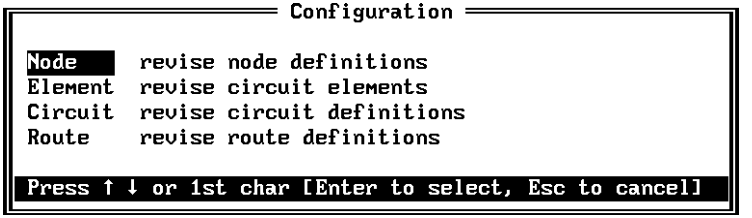
6. At this point, you'll need to configure the parameters available for your equipment type.

Deleting circuit element definitions

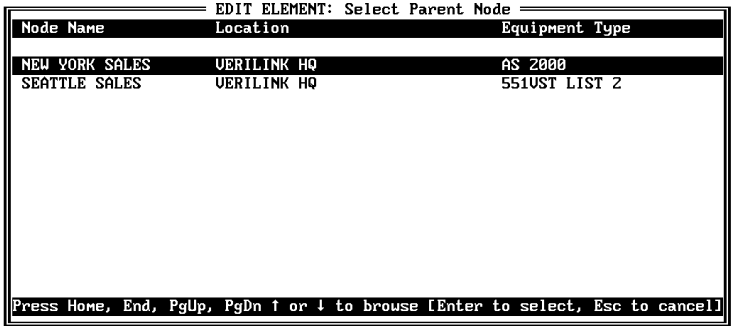
You must delete an AS2000 or ConnecT1 Plus circuit element before you can replace it with one of a different type.

To delete a circuit element configuration:

1. Starting from the *Main Menu*, select **`Configuration`**. The screen labeled *Configuration* appears.


Configuration
Node revise node definitions
Element revise circuit elements
Circuit revise circuit definitions
Route revise route definitions
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

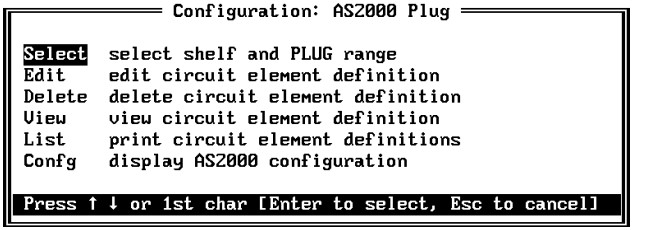
2. From this screen, select **`Element`**. The screen labeled *Edit Element: SelectParent Node* now appears.



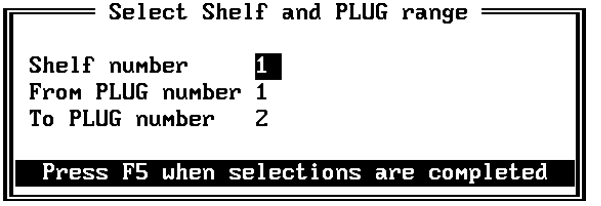
   If this menu has no nodes listed, it means that no nodes have been configured yet.

3. Select the parent node.

   If it is an AS2000 node, a screen listing configuration actions appears.


Configuration: AS2000 Plug
Select select shelf and PLUG range
Edit edit circuit element definition
Delete delete circuit element definition
View view circuit element definition
List print circuit element definitions
Confg display AS2000 configuration
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

4. Select the **`Delete`** option. The screen labeled *Select Shelf and Plug Range for Delete* appears. The menu will look very similar to this:



5. Enter the range and press F5. This saves the information to the database.

Viewing circuit element definitions

To view a circuit element definition:

1. Starting from the *Main Menu*, select **`Configuration`**.
2. From the *Configuration Menu*, select **`Element`**. The *Edit Element: Select Parent Node* screen now appears. If this menu has no nodes listed, no nodes have yet been configured.
3. After the parent node has been selected, depending on the type of node, one of the configuration actions menus will appear. See the following figures:
   - Figure 5 -7, "Configuration: 551VST List 2 Menu," on pag e5-45
   - Figure 5 -8, "Configuration: 551VST-ML List 2 Menu," on page 5-46
   - Figure 5 -9, "Configuration: AS2000 Menu," on page 5 -46
4. Select the **`View`** option. This option allows you to view an existing circuit element definition without changing it.

Printing all circuit element definitions

For a selected parent node, you can print out a report listing all parameters for that node's circuit elements. The report goes to the printer defined in the *Report* screen of the *Utilities Menu*.

To print out a node's circuit element definitions:

1. Starting from the *Main Menu*, select **`Configuration`**.
2. From the *Configuration Menu*, select **`Element`**. The *Edit Element: Select Parent Node s*creen now appears.

   If this menu has no nodes listed, no nodes have yet been configured.
3. Select the parent node has been selected. One of the configuration action menus appears. The menu that appears depends on the type of node being used. See the following figures to see which menu should appear for your type of module:

- Figure 5 -7, "Configuration: 551VST List 2 Menu," on pag e5-45
- Figure 5 -8, "Configuration: 551VST-ML List 2 Menu," on page 5-46
- Figure 5 -9, "Configuration: AS2000 Menu," on page 5 -46

4. Select the **`List`** option.

Configuration Menus of 4016 List 1 and List 2 CSUs

When the parent node is a 551VST ML List 1 or List 2 and Access Manager has configured none of its CSU circuit elements, then the first time you access these circuit elements, they are all shown with 4016 List 2 options, because the true type of CSUs are not yet known.

For example, consider a 4016 List 1 CSU installed in a 551VST ML shelf and accessed through the Data Link. When you configure the circuit element the first time, the option menu for a 4016 List 2 is displayed.

After you press **F5** to confirm the configuration with the **`Installed and Operational`** and **`Enable Remote Configuration`** options as **`YES`**, a connection is made to the far-end node and the 4016 List 1 identification is retrieved through the Data Link.

When the CSU returns a 4016 List 1 identification, it is configured as a 4016 List 1 and not a 4016 List 2. Since the CSU identification is now stored in the database, any future access to this circuit element's configuration displays the correct 4016 List 1 options menu.

CAUTION

For all installations equipped with 551VST ML List 1 or List 2 and 4016 List 1 or List 2, firmware upgrades must be performed to the NMC List 1 or List 2 Controller and the 4016 List 1 CSUs before attempting to remotely configure either of the following.

- 551VST ML List 1 or List 2 (with NMC List 1 Controller with revision 2.3 or earlier firmware) with near-end 4016 List 2. For operation with Access Manage , the NMC List 1 Controller must be upgraded to firmware revision 3.0 or later. If 4016 List 1 CSUs are provided, they must also be upgraded to firmware revision 2.4 or later.

- 551VST ML List 1 or List 2 (with NMC List 1 Controller with revision 2.3 or earlier firmware) with near-end 4016 List 1 (with revision 2.3 or earlier firmware) and far-end 551VST List 1/B, 551VST List 2, 4016 List 2, or 4016-R. For operation with Access Manager, the NMC List 1 Controller must be upgraded to firmware revision 3.0 or later. The 4016 List 1 CSUs must also be upgraded to firmware revision 2.4 or later

Configuration Options for 551VST Elements

551VST type CSU Circuit Elements Options Menu

See the preceding *Editing the Circuit Element Definitions* section for the steps required to arrive at the *Circuit Element Configuration Options* menus. See the following figures for your module's menu:

- Figure 5 -10, "551VST List 1/A Options Menu," on page 5-59
- Figure 5 -11, "551VST List1/B CSU Options Menu," on pa ge5-59
- Figure 5 -12, "551VST List 2 CSU Options Menu," on pa ge5-60
- Figure 5 -13, "NMC L1 with 4016 L2 CSU Options Menu," on page 5-60

Figure 5-10 551VST List 1/A Options Me

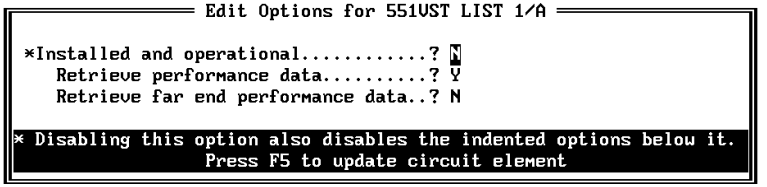

Edit Options for 551VST LIST 1/A
*Installed and operational.....? N
Retrieve performance data.....? Y
Retrieve far end performance data..? N
* Disabling this option also disables the indented options below it.
Press F5 to update circuit element

Figure 5-11 551VST List1/B CSU Options Me

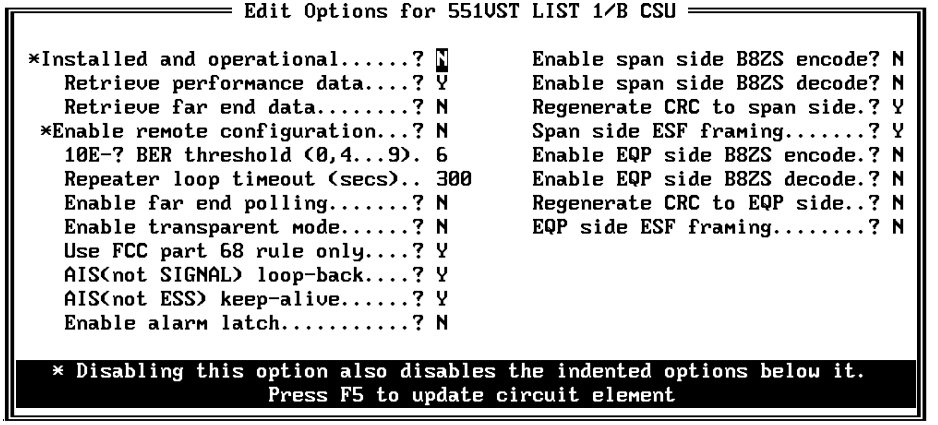

Edit Options for 551VST LIST 1/B CSU
*Installed and operational.....? N
Retrieve performance data....? Y
Retrieve far end data.....? N
*Enable remote configuration...? N
10E-? BER threshold (0,4...9). 6
Repeater loop timeout (secs).. 300
Enable far end polling.....? N
Enable transparent mode.....? N
Use FCC part 68 rule only....? Y
AIS(not SIGNAL) loop-back....? Y
AIS(not ESS) keep-alive.....? Y
Enable alarm latch.....? N
Enable span side B8ZS encode? N
Enable span side B8ZS decode? N
Regenerate CRC to span side.? Y
Span side ESF framing.....? Y
Enable EQP side B8ZS encode.? N
Enable EQP side B8ZS decode.? N
Regenerate CRC to EQP side..? N
EQP side ESF framing.....? N
* Disabling this option also disables the indented options below it.
Press F5 to update circuit element

Figure 5-12 551VST List 2 CSU Options Me

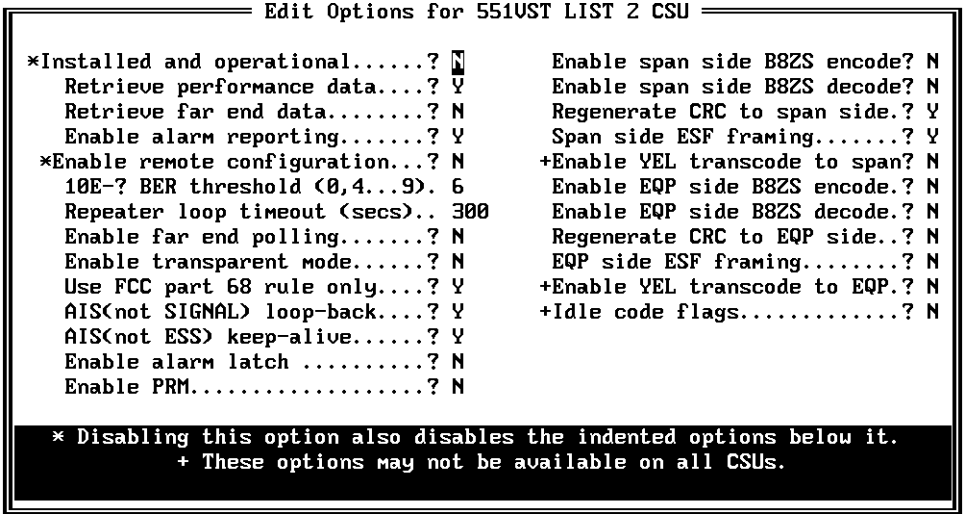
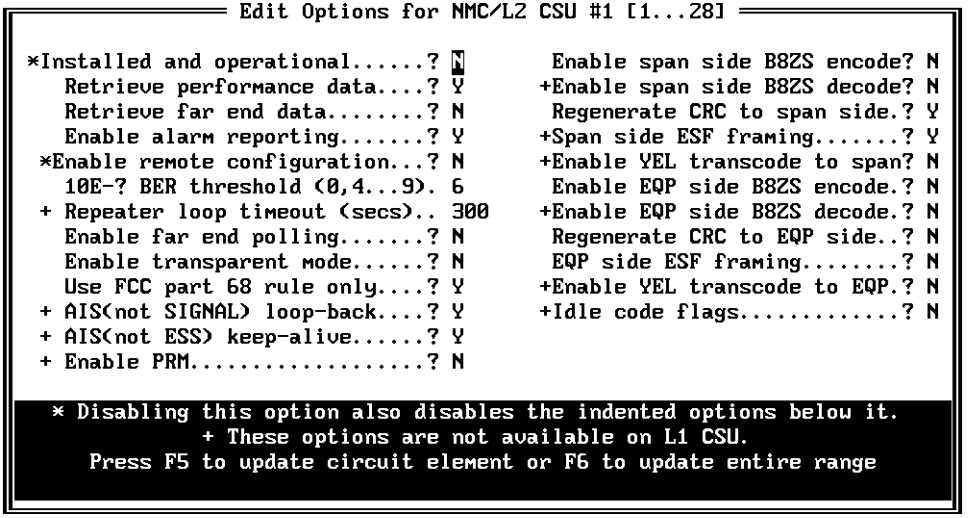

Edit Options for 551VST LIST 2 CSU
*Installed and operational.....? N
Retrieve performance data....? Y
Retrieve far end data.....? N
Enable alarm reporting.....? Y
*Enable remote configuration...? N
10E-? BER threshold (0,4...9). 6
Repeater loop timeout (secs).. 300
Enable far end polling.....? N
Enable transparent mode.....? N
Use FCC part 68 rule only....? Y
AIS(not SIGNAL) loop-back....? Y
AIS(not ESS) keep-alive.....? Y
Enable alarm latch .....? N
Enable PRM.....? N
Enable span side B8ZS encode? N
Enable span side B8ZS decode? N
Regenerate CRC to span side.? Y
Span side ESF framing.....? Y
+Enable YEL transcode to span? N
Enable EQP side B8ZS encode.? N
Enable EQP side B8ZS decode.? N
Regenerate CRC to EQP side..? N
EQP side ESF framing.....? N
+Enable YEL transcode to EQP.? N
+Idle code flags.....? N
* Disabling this option also disables the indented options below it.
+ These options may not be available on all CSUs.

Figure 5-13 NMC L1 with 4016 L2 CSU Options Me


Edit Options for NMC/L2 CSU #1 [1...28]
*Installed and operational.....? N
Retrieve performance data....? Y
Retrieve far end data.....? N
Enable alarm reporting.....? Y
*Enable remote configuration...? N
10E-? BER threshold (0,4...9). 6
+ Repeater loop timeout (secs).. 300
Enable far end polling.....? N
Enable transparent mode.....? N
Use FCC part 68 rule only....? Y
+ AIS(not SIGNAL) loop-back....? Y
+ AIS(not ESS) keep-alive.....? Y
+ Enable PRM.....? N
Enable span side B8ZS encode? N
+Enable span side B8ZS decode? N
Regenerate CRC to span side.? Y
+Span side ESF framing.....? Y
+Enable YEL transcode to span? N
Enable EQP side B8ZS encode.? N
+Enable EQP side B8ZS decode.? N
Regenerate CRC to EQP side..? N
EQP side ESF framing.....? N
+Enable YEL transcode to EQP.? N
+Idle code flags.....? N
* Disabling this option also disables the indented options below it.
+ These options are not available on L1 CSU.
Press F5 to update circuit element or F6 to update entire range

CAUTION

The 4016 List 1 CSU circuit elements can be soft-configured using Access Manager. However, service interruption may occur if the soft option settings do not agree with the hardware switches on the 4016 List 1 printed circuit boards. This occurs only when the 4016 List 1 recovers from a power failure and reconfigures itself according to the hardware switch settings. Therefore, you should configure all 4016 List 1 CSUs so that the hardware switch settings on the CSU agree with the soft options you choose in Access Manager.

The configuration options for 551VST-type CSUs are summarized in the following table:

Table 5-7 Configuration options for 551 VST-type CSU

KEY: ■ = available ◪ = available in some revisions = □ not available

	standalone CSUs					
551VST-type CSU configuration option	**List 1/A**	**List 1/B**	**List 2**	**4016-R**	**4016 L1**	**4016 L2**
Installed and Operational	■	■	■	■	■	■
Retrieve Performance Data	■	■	■	■	■	■
Retrieve Far-End Performance Data	■	■	■	■	■	■
Enable Alarm Reporting	□	□	■	■	□	□
Enable Remote Configuratio	□	■	■	■	■	■
BER Threshold	□	■	■	■	■	■
Repeater Loopback Timeout	□	■	■	■	□	■
Enable Far-End Pollin	□	■	■	■	■	■
EnableTransparent Mode	□	■	■	■	■	■
Use FCC Part 68 Rule Only	□	■	■	■	■	■
AIS (Not Signal) Loopback	□	■	■	■	□	■
AIS (Not ESS) Keep-Alive	□	■	■	■	□	■
Enable Alarm Latch	□	■	■	□	□	□
Enable PRM	□	□	◪	◪	□	◪
Enable Span Side B8ZS Encode	□	■	■	■	■	■
Enable Span Side B8ZS Decode	□	■	■	■	□	■
Regenerate CRC to Span Side	□	■	◪	◪	■	◪
Span Side ESF Framing	□	■	■	■	■[a]	■
Enable YELTranscode to Span	□	□	◪	◪	□	◪
Enable EQP SIde B8ZS Encode	□	■	■	■	■	■

KEY: ■ = available ◪ = available in some revisions = □ not available

	standalone CSUs					
551VST-type CSU configuration option	**List 1/A**	**List 1/B**	**List 2**	**4016-R**	**4016 L1**	**4016 L2**
Enable EQP SIde B8ZS Decode	□	■	■	■	□	■
Regenerate CRC to EQP	□	■	■	■	□	■
EQP Side ESF Framing	□	■	■	■	■	■
Enable YELTranscode to EQP	□	□	■	■	□	■
Idle Code Flags	□	□	◪	◪	□	◪

a. For a remote 4016 L1, you must set this option through the hardware.

Installed and Operational

This option determines whether the circuit element is installed and operational. This option, marked with an asterisk (*), must be set to **YES** to enable any of the subsequent options (including collection of performance monitoring data, alarm reporting, and so on).

Before Access Manager will allow you to set this option to **YES** for the circuit element, you must set the **Installed and Operational** option for the circuit element's parent node to **YES**.

The default setting is **NO**.

Retrieve Performance Data

Performance data is stored in registers of CSU circuit elements. Each CSU circuit element has registers to store data. Access Manager can access these registers through the **Retrieve Performance Data** function. Use the following conditions for setting this field:

- If the circuit element is accessed only through the ESF Data Link, set this option to **NO**, regardless if performance data is to be retrieved. A CSU accessed only by the ESF Data Link is a far-end CSU, and it should have its data collected by the near-end CSU.
- If the CSU circuit element is a near-end CSU, set this option to **YES** if retrieval of near-end or far-end performance data is desired.

Setting **Retrieve Performance Data** to **YES** is sufficient to enable retrieval of near-end performance data, but not sufficient to retrieve far-end performance data. For this, you'll need to set the **Retrieve Far-End Performance Data** option.

- These registers are known as near-end and far-end user registers because only the user can reset them. The Telco can examine this data but cannot reset these registers.
- The default setting for this option is **YES**.

Retrieve Far-En Performance Data

This option permits Access Manager to retrieve and store the performance data from a far-end CSU through this CSU.

For this option to work, the following two conditions must be met:

a. The **Retrieve Performance Data** option must also be set to **YES**.

b. An Access Manager circuit must be configured between the near-end and far-end CSUs.

The following descriptions will aid you in setting the **Retrieve Far-End Performance Data** field:

- If access to a far-end CSU is not required, set this option to **NO**.
- If access to a far-end CSU is required for collection of performance data, set this option to **YES** .

The default setting for this option is **NO**.

Enable Alarm Reporting

Before you can enable alarm reporting with this option, the parent node must have the following:

a. Its **Enable Alarm Reporting** option enabled, and

b. A downloaded alarm path

If a CSU circuit element should not report alarm conditions, set this option to **NO**.

If a CSU circuit element is accessed only through the ESF Data Link, set this option to **NO**.

To enable alarm reporting for CSU circuit elements accessed only through the Data Link, set this option to **YES** for the near-end CSUs whose parent node is accessed directly, by modem, or by statistical multiplexer.

The default setting for this option is **YES**.

Enable Remote Configuration

This option must be set to **YES** and the **Installed and Operational** option must also be set to **YES** to enable Access Manager to configure the selected CSU circuit elements.

In the following figures, the options following **Enable Remote Configuration** are downloaded to the CSU circuit element when F5 is pressed. View the appropriate figure (for your equipment) from the list below:

If this option is set to **NO**, any changes made are only saved in the database but are not downloaded to the CSU circuit element. Remote configuration refers to the fact that these options are downloaded from the Access Manager database.

Note: *You should set the* **Enable Remote Configuration** *option to* **YES** *only during the time that the actual remote configuration is being performed. This is to avoid performing a remote configuration (if this option is set to* **YES***) each time you edit a circuit element just to change the data to be collected.*

BER Threshold

This option sets the bit error rate (BER) threshold on the network side to a rate from 10^{-4} to 10^{-9}, with a default value of 10^{-6}.

A value of **ZERO** disables the BER alarm function.

The approximate length of time for automatic alarm to reset may vary according to which BER threshold you select, as shown in the following two tables.

- Table 5-8, "Older CSU Circuit Elements BER Alarm Rest Times"
- Table 5-9, "Newer CSU Circuit Elements BER Alarm Reset Times"

Table 5-8 Older CSU Circuit Elements BER Alarm Rest Time

Applicable equipment:	BER Threshold	Alarm Reset
• 551VST List 1/A, all revisions • 551VST List 1/B BER alarm, all revisions • 4016 List 1, all revisions • 4016 List 2, firmware revision 2.2 or earlier • 4016-R, firmware revision 2.4 o earlie • 551VST List 2, firmware revision 2.1 or earlie	10^{-4}	4 seconds
	10^{-5}	4 seconds
	10^{-6}	10 seconds
	10^{-7}	70 seconds
	10^{-8}	70 seconds
	10^{-9}	660 seconds

Table 5-9 Newer CSU Circuit Elements BER Alarm Reset Time

The longer BER alarm reset times reduce the number of BER alarms reported to Access Manager.

Applicable equipment:	BER Threshold	Alarm Reset Times
• 4016 List 2, firmware revision 2.3 or later • 4016-R, firmware revision 2.5 or later • 551VST List 2, firmware revision 2.2 or later	10^{-4}	97 -194 seconds
	10^{-5}	97 -194 seconds
	10^{-6}	97 -194 seconds
	10^{-7}	97 -194 seconds
	10^{-8}	453 - 906 seconds
	10^{-9}	647 - 1,294 seconds

Repeate Loopback Time-out

The repeater loopback time-out is the time period after which the repeater loopback (RLB) automatically releases. It has a default value of 300 seconds(5 minutes).

An RLB loops the CSU transmit-side output towards the equipment (EQP) through the CSU repeater and disconnects the incoming signal from the NET. Without this time-out, there would be no ESF Data Link access path to the CSU from the far-end to tell the CSU to drop the loopback. The RLB time-out therefore drops the loopback after the time-out period has elapsed.

You can select one of 32 time-outs ranging in duration from one second to twelve hours, as listed in Table 5-10, “Repeater Loopback Time-out Options”.

Table 5-10 Repeater Loopback Time-out Options

Seconds	Minutes (seconds)	Hour (Seconds)
1	1 (60)	1 (3,600)
2	2 (120)	2 (7,200)
3	3 (180)	3 (10,800)
4	4 (240)	4 (14,400)
5	5 (300)	5 (18,000)
10	10 (600)	6 (21,600)
20	20 (1,200)	7 (25,200)
30	30 (1,800)	8 (28,800)
40	40 (2,400)	9 (32,400)
50	50 (3000	10 (36,000)
----	-----	11 (39,600)
----	-----	12 (43,200)

Choosing zero seconds is not allowed, causing time-out to reset to one second. Any value greater than 43,200 seconds is reset to 43,200 seconds, and any value between those listed is reset to the next lowest value.

Enable Far-En Polling

Enabling this option allows the near-end CSU circuit element to poll the far-end CSU circuit element for BER alarm status. The **`Enable Far-End Polling`** option works only if the network uses ESF framing. When there is no direct or dial-up access to the far-end CSU, enable it for nodes with access to Access Manager through either direct or dial-up connections.

Only one end of a circuit (as defined in Access Manager) should be set for polling.

If both parent nodes are set for alarm reporting and both are accessible by Access Manager, set the CSUs at both ends to **`NO POLL`**, in order to avoid double reporting of the same alarm.

The default setting for this option is **`NO`** (disabled).

Enable Transparent Mode

This option has a default setting of **NO** and should remain set to **NO** unless the CSU circuit element is to transmit an unframed signal using B8ZS. Presently, only certain U.S. government agencies are allowed to use the unframed format on the public network.

In the transparent mode, if an unframed signal is received from the EQP and the CSU is not in an inband loopback mode, all BPVs received from the EQP are passed straight to the network.

In the non-transparent (normal cut-through) mode, with an unframed signal, all BPVs from the EQP are removed, except those resulting from B8ZS encoding.

Use FCC Part 68 Rule Only

When you choose this mode (**YES**), the circuit element stuffs a ONE into every string of eight (8) consecutive ZEROs whenever either the average density is below 12.5% or there are more than 80 consecutive ZEROs (referred to as FCC Part 68 Rule in earlier manuals). This is the default setting.

If you choose **NO**, this rule is still applied, plus the AT&T TR-62411 density enforcement rule is additionally applied.

AIS (Not Signal) Loopback

This option determines whether the AIS or the received signal is passed on to one side when the other side is looped back. For example, if a line loopback (LLB) is activated and this option is enabled (**YES**), an AIS signal is transmitted to the EQP.

If an LLB occurs with this option set to **NO**, the received signal from the network is transmitted to the EQP during an LLB. The default setting for this option is **YES**.

Note: *An RLB always passes the signal to the network, regardless of this option setting.*

AIS (Not ESS) Keep-Alive

This option determines whether:

- AIS (unframed ALL-ONEs) is transmitted to the network, or

- the signal received from the network is looped back to the network (ESS) as a keep-alive when a loss of signal (LOS) is detected on the incoming signal from the EQP.

The default setting for this option is **YES** (AIS keep-alive).

Enable Alarm Latch

This option determines the mode of operation of the local BER alarm. When this option is set to **NO** (default setting), the alarm indicator on the CSU clears when the alarm condition clears.

If this option is set to **YES**, the local alarm indicator stays on after the condition clears, until the alarm cutoff (ACO) button is pressed.

If the ACO button is pressed while the alarm condition still exists, the ACO LED and function activate, but the alarm LED remains lit. When the alarm condition clears, the alarm clears and the ACO LED goes off.

Enable PRM

When this option is enabled (**YES**), it allows automatic transmission of Performance Report Messages (PRMs) defined by ANSI T1.403-1989. The PRM transmits the last four seconds of performance data every second on the ESF Data Link for use by Telco monitoring equipment. Enable this option only when the use of PRMs is required. The default setting is **NO**.

Enable Span Side B8ZS Encode and Decode

The **Encode** option controls the transmit direction to the NET, and the **Decode** option controls the receive direction from the NET. These options are both defaulted to **NO**, which selects AMI line coding.

To select B8ZS coding on the NET, set both options to **YES**. These two options are combined in the 4016 List 1. If you enter **YES**, then the CSU encodes the signal to the NET and decodes the signal from the NET.

Regenerate CRC to Span Side

This option determines whether the CSU circuit element generates a new CRC-6 code toward the NET or passes the incoming CRC-6 code from the EQP to the NET.

To pass the incoming CRC-6 bits from the EQP to the network, set this option to **NO** (disable CRC regeneration when the EQP generates the CRC-6 code).

This option is defaulted to **YES**.

Note: *Revision 2.2 or later of the 551VST List 2 firmware forces the CRC options to be correct based on the framing format, regardless of what the soft option switches are set to when the CSU is powered up. This also applies to the 4016-R with firmware revision 2.6 or later and 4016 List 2 with firmware revision 2.3 or later.*

CAUTION

The correct settings for the EQP and NET CRC regeneration options in relation to the framing formats for the EQP and NET are critical to the proper operation of the ESF CSU families, except for the 551VST List 1/A. If the EQP is set for SF (D4) framing and the NET is set for ESF framing, the NET CRC regeneration option must be set to YES. If the EQP is set for ESF and the NET is set for SF, the EQP CRC regeneration must be set to YES. For any other combination of framing formats, the settings of the EQP and NET CRC regeneration options are up to you. If these options are not set correctly for the first two cases, constant CRC-6 errors result.

Span Side ESF Framing

This option determines whether the framing format transmitted to the network is ESF or SF (D4).

If SF framing is required on the network, set this option to **NO** (disable ESF). The default setting is **YES** for ESF framing.

Enable YEL Transcode to Span

When the **Enable YEL Transcode to Network** option is enabled (**YES**), it allows the CSU circuit element to detect an SF (D4) yellow alarm on the EQP side and transcode it to ESF format on the network.

If the EQP uses SF framing, the yellow alarm is B2=0 in all 24 channels. If this alarm is detected for 400 +/- 1 milliseconds, it is transcoded to an ESF yellow alarm on the ESF Data Link.

If the incoming signal from the EQP is ESF, the time for the CSU to detect the yellow alarm and start transcoding it is 63 to 66 milliseconds.

Yellow alarm transcoding to NET should be enabled any time the EQP and network framing are not the same and transcoding is desired.

This option has a default of **NO**.

Enable EQP Side B8ZS Encode and Decode

These two options control whether the equipment (EQP) side is encoding the signal toward the EQP and decoding the signal received from the EQP for B8ZS.

If AMI (Alternate Mark Inversion) line coding is required, select **NO**. This is the default setting.

Regenerate CRC to EQP

This option determines whether the CRC is regenerated toward the equipment (EQP) from the NET.

If the NET is SF (i.e., D4) and the EQP is ESF, set this option to **YES**. The default setting is **NO** (not to regenerate CRC).

Refer to the CAUTION under the **Regenerate CRC to NET Side** option.

EQP Side ESF Framing

This option determines whether the framing format on the EQP side of the CSU circuit element is ESF or SF. The default setting is **NO** (SF framing). If the EQP uses ESF, set this option to **YES**.

Enable YEL Transcode to EQP

This option on the equipment (EQP) is functionally equivalent to the **Enable YEL Transcode to Network** option above, except it is for transcoding yellow alarms toward the EQP. If the far-end CSU EQP side is also SF, the **Enable YEL Transcode to EQP** option should be set to **NO** because the yellow alarm is carried in the payload.

Idle Code Flags

When set to **NO**, this option sets the ESF Data Link idle code to ALL-ONEs. When this option is set to **YES**, the Data Link idle code is **FLAGS**. The default is **NO**.

CAUTION

Set this option to YES only if the CSUs at BOTH ENDS of the circuit have this option available. Otherwise, set this option to NO. After making your selection of CSU options, the selected circuit element configuration options can be updated individually by pressing F5. Or, the entire selected range of elements can be updated automatically by pressing F6.

Configuration Options for AS2000 and ConnecT1 Plus Elements

ConnecT1 Plus dual-line hardware is a low-cost implementation of the AS2000 firmware/software specification. The maximum configuration for a single node is 4 dual-line shelves.

Because of the similarity in the user interface with Access Manager, this section may use menu samples from either of the two products interchangeably. Most software features are typical to both products. Exceptions are noted as follows:

There are some nomenclature differences in the model names and numbers between the CSUs and DSUs of the two products. These are summarized in the following table:

Table 5-11 Model Names for AS2000 and ConnecT1 Plus CSUs and DSUs

Node Type	CSU	DSU
AS2000	NCC 2020	DIU 2130
	TAC 2010	DIU 2140
ConnecT1 Plus	CCC 1020	DIU 1130
	TAC 1010	Not applicable

The DIU 2140 is unique to AS2000 hardware. Otherwise, each element in the AS2000 line has a functional counterpart in the ConnecT1 Plus line. The ConnecT1 Plus functional counterpart to the AS2000's NCC 2020 (Channel Service Unit) is the CCC 1020, and so forth.

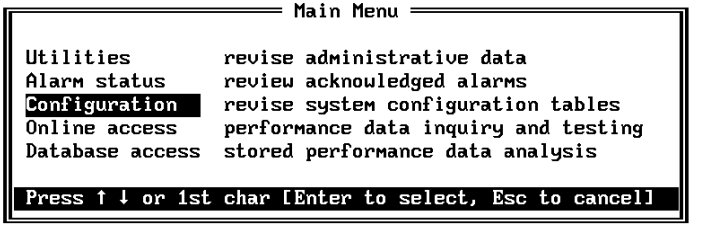
The following section will reflect these similarities by showing the ConnecT1 Plus model name and number in parentheses; for example: NCC 2020 (CCC 1020).

Note: *APA (Advanced Programmable Architecture) provides Access Manager with the ability to download code to the CSU to update firmware or provide for special functions. This feature is unique to the AS2000 hardware.*

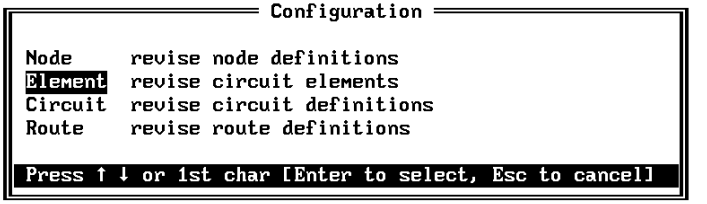
Getting to the CSU configuration scree

To get to the element configuration screen:

1. From the *Main Menu*, select **`Configuration`**.

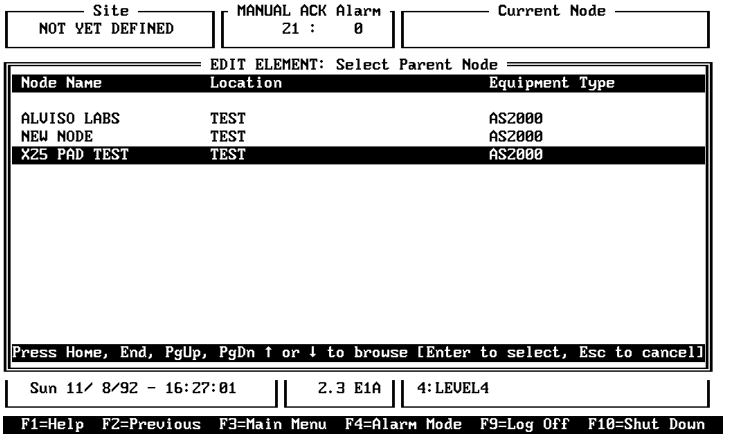

Main Menu
Utilities revise administrative data
Alarm status review acknowledged alarms
Configuration revise system configuration tables
Online access performance data inquiry and testing
Database access stored performance data analysis
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

   The screen labeled *Configuration* appears.


Configuration
Node revise node definitions
Element revise circuit elements
Circuit revise circuit definitions
Route revise route definitions
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

2. Select **`Element`**.

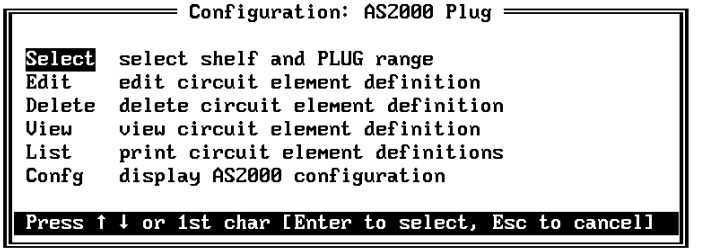
The screen labeled *Edit Element: SelectParent Node* appears.



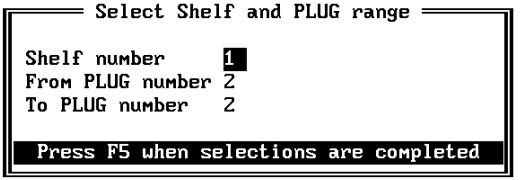
At this screen, you select the node which contains the element you want to configure.

3. Move the up and down arrows until the desired node is highlighted, and press Enter.

   The *Configuration: AS2000 Plug* screen appears.


Configuration: AS2000 Plug
Select select shelf and PLUG range
Edit edit circuit element definition
Delete delete circuit element definition
View view circuit element definition
List print circuit element definitions
Confg display AS2000 configuration
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

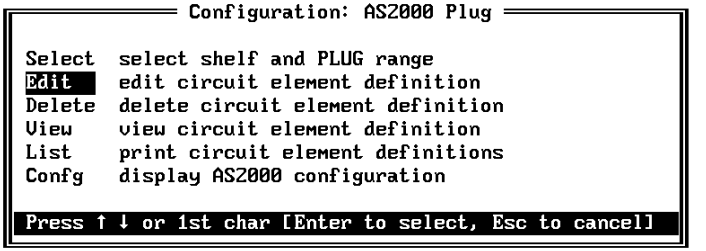
   a. **To simultaneously configure multiple CSUs which reside on the same shelf**, choose **Select**. The *Select Shelf and Plug Range* screen appears.



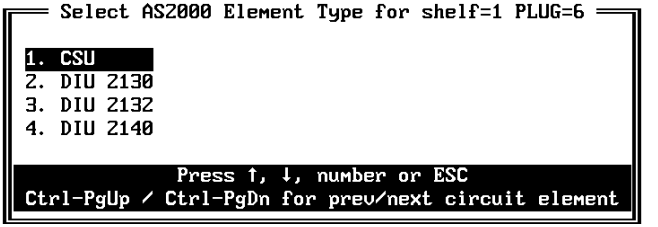
Type the number of the shelf on the first line, the leftmost slot on the second line, and the rightmost slot on the third line.

After you have made your selections, press F5 to save them. You will be returned to the *Configuration: AS2000 Plug* screen, shown at the beginning of this step.

b. **If you have just completed Step 3a or you want to configure a single plug**, select **`Edit`**.

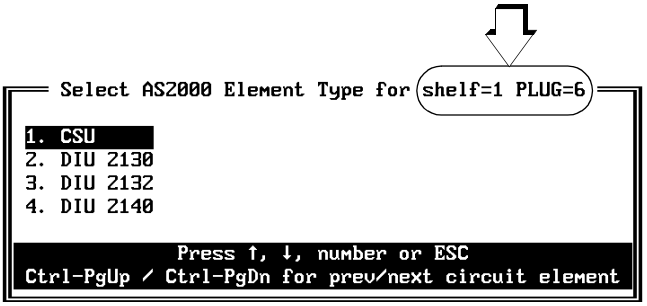

Configuration: AS2000 Plug
Select select shelf and PLUG range
Edit edit circuit element definition
Delete delete circuit element definition
View view circuit element definition
List print circuit element definitions
Confg display AS2000 configuration
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

The *Select AS2000 Element Type for Shelf _ Plug_* screen appears.

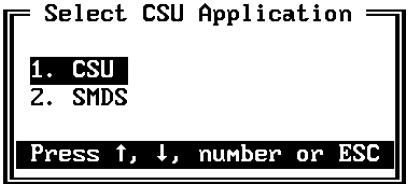

Select AS2000 Element Type for shelf=1 PLUG=6
1. CSU
2. DIU 2130
3. DIU 2132
4. DIU 2140
Press ↑, ↓, number or ESC
Ctrl-PgUp / Ctrl-PgDn for prev/next circuit element

4. If you are configuring a single plug, use Ctrl PgUp and Ctrl PgDn to choose the targeted shelf and slot number.

The numbers in the top right area of this screen will indicate which slot you are targeting at any given moment.


Select AS2000 Element Type for shelf=1 PLUG=6
1. CSU
2. DIU 2130
3. DIU 2132
4. DIU 2140
Press ↑, ↓, number or ESC
Ctrl-PgUp / Ctrl-PgDn for prev/next circuit element

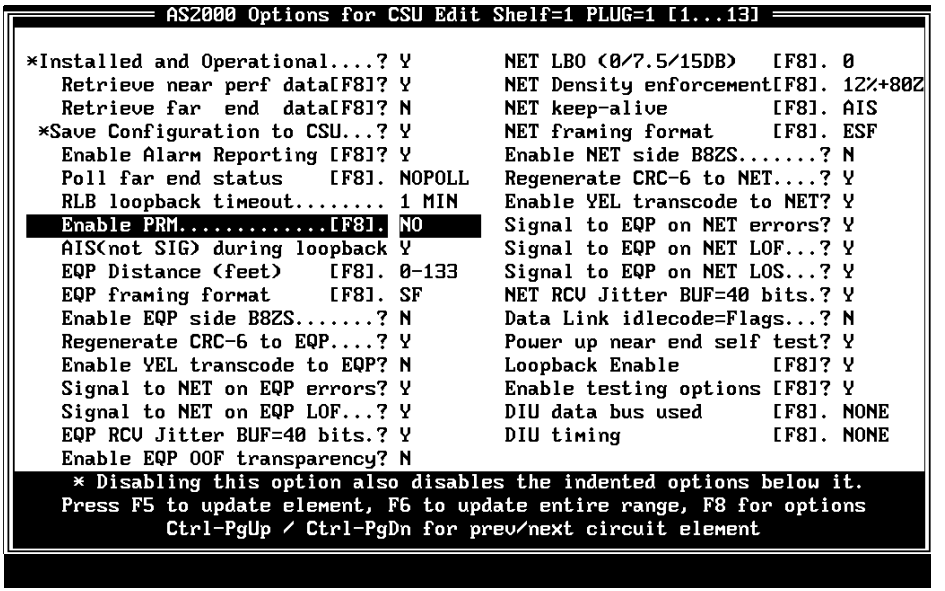
5. To configure a targeted CSU (for anything but SMDS which, by the way, is discussed in a separate soon-to-be-released manual), select **CSU**. The **Select CSU Application** screen will appear:



Select **CSU** and press Enter.

The *CSU Configuration Options* Menu appears, showing the configuration options to be edited for the first NCC 2020, CCC 1020, TAC 2010, or TAC1010 in the specified range.

Figure 5-14 Typical NCC or TAC configuration option menu


AS2000 Options for CSU Edit Shelf=1 PLUG=1 [1...13]
*Installed and Operational....? Y
Retrieve near perf data[F8]? Y
Retrieve far end data[F8]? N
*Save Configuration to CSU...? Y
Enable Alarm Reporting [F8]? Y
Poll far end status [F8]. NOPOLL
RLB loopback timeout..... 1 MIN
Enable PRM.....[F8]. NO
AIS(not SIG) during loopback Y
EQP Distance (feet) [F8]. 0-133
EQP framing format [F8]. SF
Enable EQP side B8ZS.....? N
Regenerate CRC-6 to EQP....? Y
Enable YEL transcode to EQP? N
Signal to NET on EQP errors? Y
Signal to NET on EQP LOF...? Y
EQP RCV Jitter BUF=40 bits.? Y
Enable EQP OOF transparency? N
NET LBO (0/7.5/15DB) [F8]. 0
NET Density enforcement[F8]. 12%+80Z
NET keep-alive [F8]. AIS
NET framing format [F8]. ESF
Enable NET side B8ZS.....? N
Regenerate CRC-6 to NET....? Y
Enable YEL transcode to NET? Y
Signal to EQP on NET errors? Y
Signal to EQP on NET LOF...? Y
Signal to EQP on NET LOS...? Y
NET RCV Jitter BUF=40 bits.? Y
Data Link idlecode=Flags...? N
Power up near end self test? Y
Loopback Enable [F8]? Y
Enable testing options [F8]? Y
DIU data bus used [F8]. NONE
DIU timing [F8]. NONE
* Disabling this option also disables the indented options below it.
Press F5 to update element, F6 to update entire range, F8 for options
Ctrl-PgUp / Ctrl-PgDn for prev/next circuit element

These options are described in the following sections.

Installed and Operational

This option determines whether the circuit element is installed and operational. This option, marked with an asterisk (*), must be set to **YES** in order to enable any of the following options, including collection of performance monitoring data, alarm reporting, etc.

You must set the **Installed and Operational** option for the circuit element's parent node to **YES** before Access Manager will allow you to set this option to **YES** for the circuit element. The default setting is **NO**.

Retrieve Near-En Performance Data / Retrieve Far-En Data

These options enable or disable an NCC, CCC, or TAC collection of near-end or far-end performance data.

If you select **YES** for either option, also press **F8** and then select the network and/or EQP data registers to be retrieved. The register types are NET User, NET Additional, and EQP.

The near-end defaults are **NET User=YES**, **NET Additional=NO**, and **EQP=NO**. All far-end defaults are **NO**.

If you set the **Retrieve Far-End Data** option to **YES**, you must also set the **Retrieve Near-End Data** option to **YES**, and there must be a circuit built between the near-end and far-end circuit elements.

Do not set **Retrieve Far-End Data** to **YES** at both the near-end and far-end circuit elements. For example, set **Retrieve Far-End Data** to **YES** for the near-end NCC, CCC, or TAC and set **Retrieve Far-End Data** to **NO** for far-end circuit element. The defaults for these options is **NO**, except near-end **Net Use** , which is **YES**.

Save Configuration to CSU

This option must be set to **YES** and the **Installed and Operational** option must also be set to **YES** to enable Access Manager to configure the selected CSU circuit elements.

The options following **Save Configuration to CSU** are downloaded to the CSU circuit element when F5 is pressed. If this option is set to **NO**, any changes made are saved in the database but are not downloaded to the CSU circuit element.

Enable Alarm Reporting

CSUs can report alarm conditions to Access Manager when excessive errors occur or the line service is degraded.

If you don't want the CSU to report alarm conditions to Access Manager, your choice is simple. Set the **Enable Alarm Reporting** field to **NO**.

To allow the CSU to report alarm conditions to Access Manager:

1. Set **Enable Alarm Reporting** to **YES**.
2. Make sure that in the *Node Configuration* screen of the parent node, you have:
   - set the **Enable Alarm Reporting** to **YES**
   - downloaded the alarm path for that node

   Otherwise, the CSU will send alarms to the node controller, but the node controller will not forward these alarms to Access Manager.

3. Review the alarm condition settings by pressing F8 to get the *Alarm Condition Sub-Menu* screen.

```
Alarm CONDITION SUB-MENU:

EQP Loopback alarm relay......? Y    NET BER threshold (0,4...9)...? 6
EQP BER threshold (0, 4...9)..? 6    NET ES-L threshold............? 25
EQP ES-L threshold............? 25   NET ES-L intervals count......? 1
EQP ES-L intervals count......? 1    NET ES threshold..............? 25
EQP ES threshold..............? 25   NET ES intervals count........? 1
EQP ES intervals count........? 1    NET UAS threshold.............? 10
EQP UAS threshold.............? 25   NET UAS intervals count.......? 1
EQP UAS intervals count.......? 1    Alarm set delay time........... 62
NET Loopback alarm ready......? Y    Alarm clear delay time......... 10
                                     Alarm clear delay time for LOF. 10

                  Press F5 to return to previous menu
```

Here you decide how many errors in how short a time period are excessive and worth defining an alarm condition.

Defining alarm conditions

Alarm conditions are designed to alert you to conditions that can negatively affect service on the T1 line. From a functional point of view, alarm conditions actually include alarms, performance alerts, and events.

- *Alarms* imply that something is out-of-service or broken.
- *Performance alerts* indicate that line service is degraded. Usually, a user-specified threshold has been exceeded.
- *Events* include loopbacks. An alarm condition from setting a loopback lets you know, preventatively, that you are putting part of the line out of service.

These distinctions are not reflected in the registers nor do they need to be. They're only made to give you an understanding of the wide range of conditions which solicit alarms.

To define alarm conditions, follow these steps:

1. **Set the EQP BER (Bit Error Rate) threshold and the NET BER threshold**.

The NET BER threshold is the maximum bit error rate allowed for signals coming from the network. The EQP BER threshold is the maximum bit error rate allowed for signals coming from the network. Each can be set to any value between 10^{-4} and 10^{-9}. The default is to 10^{-6}.

Go to the **EQP BER threshold** field , and enter the positiv value of the exponent. For example, for a bit error rate of 10^{-5}, enter **5**. Remember, the higher the exponent, the lower the threshold. Do the same with the **NET BER threshold** field.

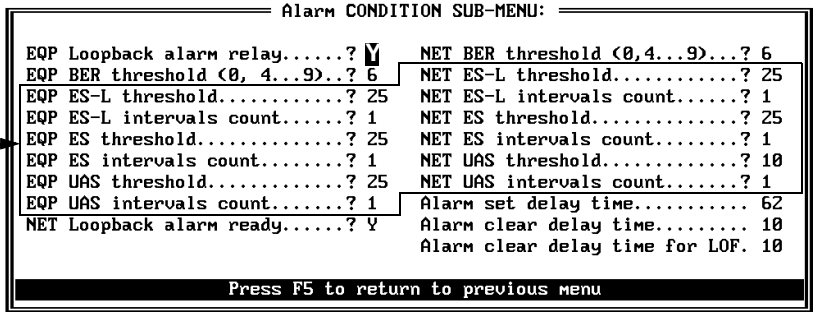
The default value is **6**, for 10^{-6}.

To disable the alarm, select **0** (zero).

2. **Set alarm thresholds and interval counts** for each of these three types of trouble seconds:

   - **Errored Seconds-Line** - ES-L; that is, the number of seconds with bipolar violations, indicating formatting errors. This refers only to BPVs which are not an intentional part of B8ZS line coding.
   - **Errored Seconds** - ES; that is, the number of seconds with CRC-6 errors, indicating a violation of data integrity
   - **Unavailable Seconds** - UAS, that is, any second during which a UASS (Unavailable Signal State) exists

trouble second definitions


Alarm CONDITION SUB-MENU:
EQP Loopback alarm relay.....? Y
EQP BER threshold (0, 4...9)..? 6
EQP ES-L threshold.....? 25
EQP ES-L intervals count.....? 1
EQP ES threshold.....? 25
EQP ES intervals count.....? 1
EQP UAS threshold.....? 25
EQP UAS intervals count.....? 1
NET Loopback alarm ready.....? Y
NET BER threshold (0,4...9)...? 6
NET ES-L threshold.....? 25
NET ES-L intervals count.....? 1
NET ES threshold.....? 25
NET ES intervals count.....? 1
NET UAS threshold.....? 10
NET UAS intervals count.....? 1
Alarm set delay time..... 62
Alarm clear delay time..... 10
Alarm clear delay time for LOF. 10
Press F5 to return to previous menu

First, an explanation of *thresholds* and *interval counts*.

An interval is a 15-minute (900-second) segment of time, and there are 96 intervals in 24 hours. An **Interval Count** is defined as the time window within which you want to count trouble seconds. It includes the number of intervals you specify plus the current interval you're in.

A **Threshold** is the maximum number of trouble seconds allowable in an **Interval Count**.

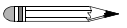
It takes the length of the configured **Interval Count** to clear an alarm.

These are the default values:

Type of Trouble Second	Interval Count (0-96 intervals)	Threshold (0-900 trouble seconds)
ES-L (BPVs)	1	25
ES (CRC-6 errors)	1	25
UAS	1	10

If the interval count is **0**, then:

- only the current interval is used to determine if the **Threshold** is exceeded, and
- the alarm is cleared at the end of the current interval.



To disable alarm reporting during excessiveBPV, ES, or UAS errors, set their threshold values to ***0****.*

3. **To report turn on the alarm relay when a loopback toward the NET is either activated or cleared**, set the **NET Loopback Alarm Relay** option to **YES** (default).

   The alarm relay is a 3-pin terminal strip, surrounded by bright orange plastic, located in the middle of every CIM faceplate. It can be connected to an external device---such as a light, bell, or buzzer---to provide a noticeable alarm when a loopback toward the net is activated or cleared.

4. **Decide how long an alarm condition must persist** before the CSU reports it to Access Manager.

Go the the **Alarm Set Delay Time** field, and select the delay time in the range of **0** to **255** seconds.

The default value for the this option is **3** seconds.

5. **Decide how soon an alarm condition will clear.**

   Go to the **Alarm Clear Delay Time** field, and select the delay time in the range of **0** to **255** seconds.

   The default setting for the this option is **10** seconds.

6. **Decide how soon an LOF alarm will clear.**

   Go the the **Alarm Clear Delay Time for LOF** field, and select the delay time before a loss of frame (LOF) alarm condition clears. Choose a value in the range of **0** to **255** seconds.

   The default is **10** seconds.

Poll Far-End Statu

Set this option to one of the following:

Option	Description
NO POLL	At both ends, to disable alarm polling. Select this option (the default) when the nodes at both ends are connected to Access Manager and both nodes report local alarms. Otherwise, the same alarm is reported to Access Manager twice.
POLL	To have the near-end CSU automatically poll the far-end CSU for alarms every four seconds and report those alarms to Access Manager.
UNSOL	To have the far-end NCC, CCC, or TAC automatically (when it detects a Loss of Signal) send its alarm status to the near-end NCC, CCC, or TAC. Select this option for the far-end CSU circuit element when the near-end CSU is set to **POLL**.

RLB Loopback Time-out

Use this option to define the time period after which an RLB releases. Choose the setting desire from the following list:

- **DISABLE**
- **xx SE** , where xx = 01 to 59

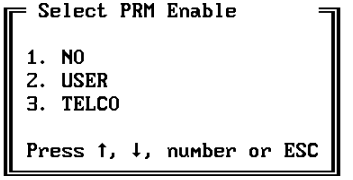
- **xx MIN**, where xx = 01 to 59
- **xx HR**, where xx = 01 to 24
- **FOREVER**

The default is 1 minute.

Enable PRM

The CSU can generate performance report messages (PRMs) over the ESF Data Link once every second. If enabled, the PRM carries a bit which identifies the PRM sender

To enable these messages, go to the **`Enable PRM`** field and press the (F8) function key. The *Select PRM Enable* screen will appear.



Choose from one of the following options:

- To not generate the PRM, select **`NO`** (PRM disabled). This is the default option.
- To generate PRMs and label them as sent by the CPE (Customer Premises Equipment), select **`USER`**.
- To generate PRMs and label them as sent by the Telco, select **`TELCO`**.

AIS (not SIG) During Loopback

This option determines whether the AIS or the received signal (SIG) is passed on to one side when the other side is looped back.

For example, if a line-side line loopback (LLB) is activated when this option is set for AIS, then AIS is transmitted to the EQP when this option is set to **YES** (default setting).

If the option is set to **`NO`**, the received signal from the network is transmitted to the EQP during an LLB.

Note: *An RLB always passes the signal to the network, regardless of this option setting.*

EQP Distance

This option allows you to select the amount of equalization required (in cabling feet) for the transmit signal on the equipment (EQP) side to meet the DSX-1 interface requirement.

Press **F8** to see the available values, then select the value corresponding to the distance from the CSU to the equipment or DSX-1 bay.

The default setting is **`0 to 133 feet`**.

EQP (Equipment Framing Format

Use **F8** in this option to select the framing format used on the equipment (EQP) side of the CSU.

The options are **SF** (Superframe), **ESF** (Extended Superframe), and **UNFRAMED**. The default is **SF**. If the CSU is used with one or more non-drop-and-insert DIU 2130s, DIU 1130s, and/or DIU2140s, this option is ignored by the CSU.

Note: *If EQP Framing Format is Unframed, then the NET Framing Format must also be Unframed.*

Enable EQP Side B8ZS

Set this option to **YES** if the equipment (EQP) uses B8ZS line coding, or to **NO** if it uses AMI (Alternate Mark Inversion). The default setting is **NO** (AMI coding).

If the CSU is used with one or more DIU 2130s, DIU 1130s and/or DIU 2140s, this option is ignored by the non-drop-and-insert CSU.

Regenerate CRC-6 to EQP

To correctly process CRC-6 codes, set this option to **YES** if the equipment (EQP) framing mode is ESF and the network framing mode is SF.

If both the equipment and network use ESF framing, set this option to **NO**. The default setting is **YES**.

Enable Yellow Alarm Transcode to EQP

This option allows the CSU to convert an SF yellow alarm (all B2 bits = ZERO) from the network to an ESF yellow alarm (repetitive [11111111 00000000] bit pattern on the ESF Data Link).

If the network uses SF framing and the equipment (EQP) uses ESF framing, select **YES**.

If the CSU is used with one or more DIU 2130s, DIU 1130s, and/or DIU 2140s, such as drop-and-insert, choose **NO**.

Otherwise, set this option to **NO** (default setting).

Signal to NET on EQP Errors

If you want the CSU to continue sending the signal from the equipment to the network, even after detecting the EQP side signal has excessive BER, set this option to **YES**.

The default setting is **YES**.

CAUTION

Setting this option to NO causes an out-of-service condition during excessive BER. It begins when the BER threshold is exceeded and lasts as long as the condition persists, with an additional 97 seconds to 22 minutes (depending on the *BER Threshold* option selected). If NO is selected, the signal applied is AIS.

Signal to NET on EQP LOF

This option is similar to the one above for an alarm caused by a Loss of Frame (LOF) condition on the incoming signal from the network. Also set this option to **YES** if the CSU is used with DIUs. The default setting is **YES**.

CAUTION

If NET Keep-Alive is FAIS (framed AIS) or AIS, then setting this optio to NO causes out-of-service condition during excessive BER; it starts when the OOF (Out Of Frame) is detected and lasting as long as the condition persists, with an additional 0 to 255 seconds (depending on the user-selected alarm delay time). The default is 10 seconds.

EQP RCV (Receive) Jitter BUF (Buffer) = 40 Bits

Each CSU has an input buffer in each direction that allows it to tolerate jitter in the incoming signal from the equipment (EQP) and network. The 40-bit buffer provides maximum jitter tolerance and a maximum signal throughput delay time of 42 microseconds (65 bits) in each direction.

Set the equipment-side jitter buffer to **YES** (default value) for most applications.

To reduce the equipment-side throughput delay time to 17 microseconds (27 bits), select **NO**. If **NO** is selected, a buffer length of 16 bits is used. However, this setting also reduces the CSU's input jitter tolerance.

Enable EQP OOF Transparency

When enabled (set to **YES**), this option allows the CSU to pass all BPVs, including both non-B8ZS and B8ZS-coded ones, from the equipment (EQP) to the network.

When transparency is disabled (**NO**), the CSU removes non-B8ZS BPVs from the equipment input and passes only the B8ZS-coded BPVs to the network. However, remember that B8ZS is passed only if the CSU is configured for B8ZS NET side encoding and the equipment is set for B8ZS decoding.

The default is **NO**.

Network LBO

Set this option for the amount of line build-out (LBO) needed to provide a DS1 signal of the proper amplitude to the first line repeater on the network. Choose one of the following:

0 dB The first repeater is 2000 to 3000 feet from the CSU. This is the default setting.

7.5 dB The first repeater is 1000 to 2000 feet away.

15 dB The first repeater is less than 1000 feet away.

0 dB The network does not use line repeaters.

NET Density Enforcement

This option lets you select the type of minimum-ONEs density enforcement on the network. If the CSU uses AMI line coding, choose one of the following settings:

12%+80Z When you choose this mode, the CSU stuffs a ONE into every string of eight (8) consecutive ZEROs whenever either the average density is below 12.5 percent or there are more than 80 consecutive ZEROs. This is the default setting.

AT&T TR-62411 When you choose this mode, the CSU stuffs a ONE into every string of more than 15 consecutive ZEROs or whenever there is not a minimum of N ONEs in every window of 8(N + 1) consecutive pulses, where N has a value from 1 to 23.

1 in 80 Stuffs a ONE into every string of more than 80 consecutive ZEROs.

1 in 15 Stuffs a ONE into every string of more than 15 consecutive ZEROs.

NONE Pulse density enforcement is not used. Use this mode for AMI unrestricted ZEROs operation. Also, select NONE if B8ZS coding is used.

NET Keep-Alive

This option lets you choose which type of signal the CSU applies to the network as a keep-alive. The options are:

FAIS framed alarm indication signal, all-ONEs

AIS unframed AIS

NONE pass signal to NET

LPBK looped network signal through a line loopback [LLB].

The default setting is for unframed **AIS**.

NET Framing Format

Select the framing format used on the network. This can be **SF** (D4), **ES** , or **UNFRAMED**, as required. The default setting is **ES** . The far-end circuit element must use the same framing option.

Note: *If EQP Framing Format is Unframed, then the NET Framing Format must also be Unframed.*

Enable NET B8ZS

If clear-channel operation is required, enter **YES** to select B8ZS line coding.

When selecting B8ZS coding, first be sure the network is compatible with B8ZS, which introduces intentional bipolar violations into the transmitted DS1 signal. Call the telephone company to confirm this. Set this option identically at both ends of the circuit.

Otherwise enter **NO**, which will select AMI coding (default setting).

Regenerate CRC-6 to NET

If the equipment uses SF framing and the network uses ESF, select **YES** to ensure proper handling of CRC-6 codes toward the network by the CSU. This is the default setting.

If both the equipment and network use ESF, set this option to **NO** (disabled).

Enable YEL (Yellow Alarm Transcode to NET

If the equipment uses D4 framing and the network uses ESF, select **YES** (default setting) to allow the CSU to transcode an SF (D4) yellow alarm to an ESF yellow alarm on the ESF Data Link.

If both the equipment and network use the same type of framing, select **NO** to disable yellow alarm transcoding. When disabled, yellow alarms are passed through without being transcoded.

Yellow alarm is also known as Remote Alarm Indication Signal (RAIS).

Signal to EQP on NET Errors

The **Signal to EQP on NET Errors** option is functionally similar to the **Signal to NET on EQP Errors** option previously described. See warning in that section. The default is **YES** (signal).

Signal to EQP on NET LOF

This option functions like **`Signal to EQP on LOS`** option described below, except the trigger condition is LOF. See warning in that section. The default is **YES**.

Signal to EQP on NET LOS

If this option is set to **YES**, then whatever signal is received from the network is sent to the equipment.

If this option is set to **NO**, then AIS is sent to the equipment until the LOS alarm clears. The default is **YES** (signal).

CAUTION

Setting this option to NO causes an out-of-service condition during LOS from the network, starting when the condition is detected and lasting as long as the condition persists plus from 0 seconds to 255 seconds (depending on the user-selected alarm delay time). The default is 10 seconds.

NET RCV Jitte BUF = 40 Bits

This option is functionally similar to the EQP **`Receive Jitter Buffer = 40 Bits`** option, except that the buffer in this option is for the incoming signal from the network. The default setting is **YES**.

Data Link Idle Code (Idle code) = Flags

When set to **YES** (the default), the ESF Data Link idle code is ALL-ONEs. When this option is set to **NO**, the Data Link idle code is Flags.

Power-up Near End Self Test

Set this option to **YES** (default) to allow the CSU to automatically perform a self-test each time it is powered up.

Loopback Enable

Set this option to **YES** (default setting) if you want the CSU to respond to loopback commands sent to it either on the ESF Data Link or directly from Access Manager.

Then, press F8 to go to the *Loopback Enable* screen, and enable each desired loopback by typing **Y**. All loopbacks are enabled by default.

Figure 5-15 Loopback Enable Sub-menu

```
LOOPBACK ENABLE SUB MENU

Enable LLB.....................? Y
Enable PLB.....................? Y
Enable ELB.....................? Y
Enable RLB.....................? Y
Enable LLB (T1 403)............? Y
Enable PLB (T1 403)............? Y

Press F5 to return to previous menu
```

Enable Testing Options

To allow the CSU to do any of the following:

- Send or respond to inband loopback codes
- Apply a test signal to a DS1 circuit when commanded by Access Manager via the *On-line Menu*
- Apply a test signal to a DS1 circuit when commanded by local switch controls at the circuit element

Execute the following steps:

1. Set the **Enable Testing Options** field to **YES**.
2. Press F8 to access the following screen.

```
INBAND LOOPBACK CODES and TEST SIGNALS SUB-MENU:

Send/Receive Inband Loop Code....? Y
Send Test Signal.................? Y
Framed Test Signal...............? Y

   Press F5 to return to the prvious menu
```

3. Select a framed or unframed test signal.

Set the **Enable Testing Options** field to **NO** (disabled) to:

- use external test equipment, or
- prevent unauthorized circuit testing through the CSU

The default for all testing options is **YES**.

Send/Receive Inband Loop Cod

This option allows the CSU to control loopbacks with inband loop-up and loop-down codes. If this option is disabled, the CSU does not respond to inband loopback codes, nor will it send inband loopback codes.

Send Test Signal

This option allows the CSU to apply the desired test signal to the circuit. If this option is disabled, the CSU does not apply test signals when commanded by an operator.

Framed Test Signal

This option allows the CSU to apply framed test signals to the circuit. If this option is set to **NO** (disabled), the CSU applies only unframed test signals.

DIU Data Bus Used

When the CSU is used with DIUs, it interfaces with them through one or two of the three data buses on the Access System shelf backplane.

Press F8 to see the available choices. If the CSU is used with:

- no DIUs, select **NONE** (the default).
- DIUs in applications without drop-and-insert, assign data bus **A**, **B**, or **C**, whichever is available.

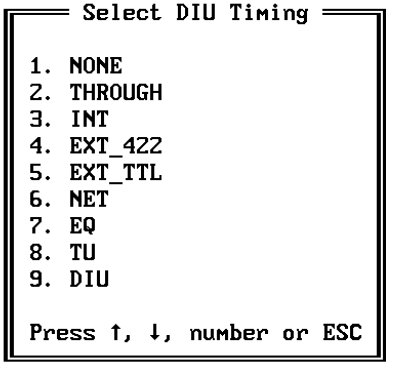
WARNING

If the TIU 2850 or TIU 1850 is installed in the shelf, do not select *C,* because C is dedicated to providing timing from the TIU to the shelf If the TAC is used with DIUs for drop-and-insert operation, selec either D&I NET or D&I EQ (depending on the desired direction for this operating mode). If D&I NET is chosen, databus A is assigned. If D&I EQP is chosen, data bus B is assigned.

DIU Timin

DIUs must be synchronized to the CSU for proper operation.

To view the timing options, press F8. The following screen appears:



See the individual CSU hardware manuals for further information on the clock source options listed below.

Option	Conditions
NONE (default)	Choose if the CSU circuit element is not associated with any DIUs. The **Data Bus Used** option must first be set to **NONE**.
THROUGH	Choose fo CSU/DIU drop-and-insert configurations that require through timing. This is the choice for drop-and-insert operation. Do not select this for DSU/CSU mode of operation.
INT	Choose fo CSU /DIU configurations in which the clock generated internally is to be used for data timing and both DS1's transmit timing.
EXT 422 or EXT TTL	Choose one if an external 1.544 MHz gapped or non-gapped clock is connected directly to the CSU. Choose EXT 422 if the clock is RS422, or choose EXT TTL if the clock is TTL.
NET	Choose fo CSU/DIU configurations in which timing is provide from a clock recovered from the incoming network signal. This is the default setting for CSU/DIU configurations without drop-and-insert.

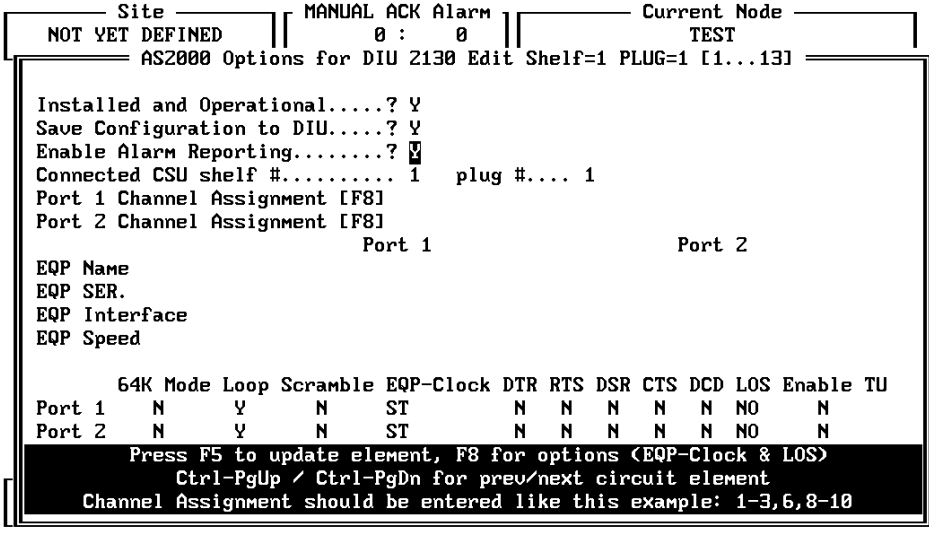
Option	Conditions
EQ	Choose for drop-and-insert configurations in which timing is provided from a clock recovered from the incoming DS1 equipment signal. Do not select this for DSU/CSU mode of operation.
TU	Choose if the CSU circuit element you are configuring is to receive its clock from a TIU 2850 installed in the shelf, regardless of the source of the clock that is used.
DIU	Choose if the timing source is the TT (Terminal Timing) signal from a data equipment device connected to a DIU 2130 or DIU 1130 data port. This selection also automatically assigns data bus C to the CSU for TT signal application to the CSU.

After making your selection of CSU options, the selected CSU' configuration options can be updated individually by pressing F5. Or, all the CSUs in the entire selected range of slots can be updated automatically by pressing F6.

DIU 2130 Configuration

To configure the DIUs, choose circuit element type **DIU 2130** in Step 3 of "Getting to the CSU configuration screen" on page 5 -72. The*DIU 2130 Options* Menu appears, showing the configuration options to be edited for the first DIU 2130 in the specified range. These options are described as follows:

Figure 5-16 DIU 2130 Options Menu


Site
NOT YET DEFINED
MANUAL ACK Alarm
0 : 0
Current Node
TEST
AS2000 Options for DIU 2130 Edit Shelf=1 PLUG=1 [1...13]
Installed and Operational.....? Y
Save Configuration to DIU.....? Y
Enable Alarm Reporting.....? Y
Connected CSU shelf #..... 1 plug #.... 1
Port 1 Channel Assignment [F8]
Port 2 Channel Assignment [F8]
Port 1
Port 2
EQP Name
EQP SER.
EQP Interface
EQP Speed
64K Mode Loop Scramble EQP-Clock DTR RTS DSR CTS DCD LOS Enable TU
Port 1 N Y N ST N N N N N NO N
Port 2 N Y N ST N N N N N NO N
Press F5 to update element, F8 for options (EQP-Clock & LOS)
Ctrl-PgUp / Ctrl-PgDn for prev/next circuit element
Channel Assignment should be entered like this example: 1-3,6,8-10

Installed and Operational

This setting should be the same as the **`Installed and Operational`** option setting of the associated CSU.

Enable Alarm Reporting

This setting should be the same as the **`Enable Alarm Reporting`** option setting of the associated CSU.

Save Configuration to DIU

To store the configuration from the database into the DIU, set the **`Save configuration to DIU`** option to **`Y`**. If this option is set to **`N`**, any updated changes are saved to the database but are not downloaded to the DIU.

Connected CSU Shelf and Plug Numbers

Enter the Access System 2000 shelf number and plug-in slot number of the CSU to which the DIU is connected. This setting allows the DIU to send data to and receive data from that CSU over the DIU data bus assigned to that module. The shelf number can be from 1 to 4.

Channel Assignment

Assign one or more DS0 channels of the DS1 line to each DIU 2130 and DIU 1130 data port, based on the data equipment's transmission speed (**`EQP Speed`**). One channel is required for every 56 kbps or 64 kbps of bandwidth.

For example, if the customer data equipment operates at 256 k b ps, it needs four DS0 channels (4 channels x 64 kbps per channel = 256 kbps bandwidth) for DS1 transmission.

There are three types of channels:

Contiguous The channel assignments are in numerical sequence (for example: Port 1 = 1-3, Port 2 = 14-17, and so on, for the ports of other DIUs used with the same CSU). Contiguous channel assignments allow the DIU 2130 and DIU 1130 to interface properly with AT&T Accunet bundled DS0 applications.

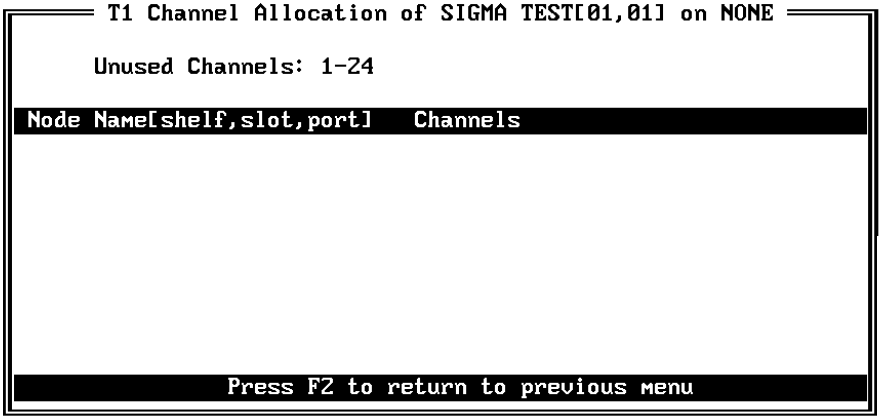
Alternate Alternate channels are those which are assigned to a port where every other channel carries user data, and the channel before and channel after are unassigned. The DIU fills each 8-bit word of the unassigned channel slots with at least two ONEs, as outlined in AT&T TR 62421. (For example, Port 1 = 1, 3 and Port 2 = 6, 8, 10.) Alternate channel assignments allow the DIU 2130 and DIU 1130 to properly interface with the AT&T Accunet bundled DS0 applications when unrestricted zeros applications are required and B8ZS is not available.

Random The random channels are those which are not assigned in either a contiguous or alternate sequence. Some carriers allow users to create bundled DS0 applications with channels assigned in any order they choose (i.e., random channel assignments).

To assign DSO channels:

1. At the **`Port Channel Assignment`**/**`Port 2 Channel Assignment`** lines of the *DIU 2130* and *DIU 1130 Option* Menus, press the F8 key.

   The *T1 Allocation* screen appears.


T1 Channel Allocation of SIGMA TEST[01,01] on NONE
Unused Channels: 1-24
Node Name[shelf,slot,port] Channels
Press F2 to return to previous menu

   This screen allows the user to view which channels are already allocated and which channels are available.

2. Enter the channel assignments of unused channels in order, separating each channel from the next by commas. Contiguous

channels may be entered by using a hyphen between the first and last channel.

Certain DIU 2130 and DIU 1130 applications require unrestricted ZEROs density operation. Remember the following:

- If the data rate is a multiple of 56 kbps and you configure the DIU for the 56 kbps user data/channel mode, the DIU data ports are in the unrestricted ZEROs density operating mode.
- If the data rate is a multiple of 64 kbps and you configure the DIU for the 64 kbps user data/channel mode, review the configuration of the CSU used with the DIU 2130 and DIU 1130. Youhave unrestricted ZEROs operation if the configuration of the CSU is (1)**`NET Density Enforcement = NONE`**, and (2)**`Enable NET B8ZS = YES`**.
- If the data rate is a multiple of 64 kbps and you configure the DIU for the 64 kbps user data/channel mode, you have unrestricted zeros operation if your **`Channel Assignments`** are not contiguous and none of the channels are adjacent. Alternate channel assignments satisfy this criterion.

EQP Name

Type the name of the equipment (EQP) connected to I/O Port 1 of the DIU. This name can have up to 25 characters, including spaces. After entering this name, press the right-arrow key and do the same for the equipment on I/O Port 2.

EQP SER

Type the serial number (or other identification) of the equipment (EQP) associated with the port. Move to the next column, and enter the serial number of this port's equipment. Each entry can be up to 25 characters. This parameter is informational only.

EQP Interface

Enter the type of interface (V.35, RS449, or RS530) of each data port. This parameter is informational only.

EQP Speed

Type the transmission speed for each port on the next line of the menu. This rate must be 56 kbps, 64 kbps, or a multiple of either rate. The total (aggregate) rate for the data ports of all DIU 2130s and DIU 1130s connected to a CSU cannot exceed 1.536 Mbps. This parameter is informational only.

64K Mode

If you set this option to **YES**, each channel of the DS1 line carries 64 kbps of data. If you set this option to **NO** (default setting), each DS0 channel carries 56 kbps of data. If the data rate of your equipment is a multiple of 56 kbps, set this option to **NO**. If it is a multiple of 64 kbps, set this option to **YES**.

Loop

If you enable this option (Y), the DIU responds to loopback commands.

Scramble

The customer data on a DIU data port may require protection from unauthorized access.

If scrambling ***is*** required, set this option to **YES** on each equipment (EQP) port. This setting allows the DIU to randomize the data before multiplexing and sending it to the CSU.

If scrambling ***is not*** required, set this option to **NO** (default setting) on the associated DIU data port.

Be sure to set the **Scramble** option the same way at the far-end NCC, DIU 1130 so that it can restore the original customer data upon receiving it.

EQP Clock

Select the timing source for the incoming data from the customer data equipment. This can be either the **TT** (Transmit Timing) signal from the data equipment or an internal clock (either ST or inverted ST) generated by the DIU. If the **TT** lead is not available from the data equipment, select either **ST** or **INVERT ST** to have the DIU clock the data in. The ST choice depends on which clock signal transition is to be used for data

timing and probably requires some trial and error. First, choose **ST** and check the end-to-end data transmission on the data port. If transmission does not work properly, choose **INVERT S** .

EQP Handshaking

The DIU 2130 and DIU 1130 supports five handshaking signals on each data port. The V35 names appear in the DIU menu screen, although RS449 and RS530 interfaces are also available. Set each signal to **N** or **Y**.

The DIU 2130 and data port handshaking signals are listed below.

Table 5-12 DIU 2130 and Data Port Handshaking Signals

Handshaking Signals			Circuit Direction	EQP Handshaking Options	
V.35 (screen)	RS449	RS530		N (default)	Y
RTS	RS	CA	to DIU	signal from data equipment	forced on (asserted)
DTR	TR	CD	to DIU	signal from data equipment	forced on (asserted)
CTS	CS	CB	from DIU	follow conditioned RTS from data equip. (Note 1	forced on (asserted)
DSR	DM	CC	from DIU	follow conditioned DTR from data equip. (Note 2)	forced on (asserted)
RLSD (DCD)	RR	CF	from DIU	on (Note 3)	forced on (asserted)

NOTE 1. (CTS) Set this option to **NO** (default) if you want CTS from the DIU to follow conditioned RTS from the data equipment. If **NO**, CTS turns off automatically if the associated NCC, CCC, or TAC goes into an LOF state or receives a Yellow (i.e., RAI) alarm regardless of RTS. Or, set this option to **YES** to permanently turn on DSR.

NOTE 2. (DSR) Set this option to **NO** (default) if you want DSR from the DIU to follow conditioned DTR from the data equipment. If **NO**, DSR turns off automatically if the associated NCC, CCC, or TAC goes into an LOF state or receives a Yellow alarm regardless of DTR. Or, set this option to **YES** to permanently turn DSR on.

NOTE 3. (RLSD) Set this option to **NO** (default) if you want RLSD on except when the associatedNCC, CCC, or TAC goes into an LOF state. Or, set the RLSD t **YES** to permanently turn it on.

Loss of Signal

Select from one of the following options:

NO Do not generate a Loss of Signal signal.

RTS Generate an LOS alarm when RTS is missing.

DTR Generate an LOS alarm when DTR is missing.

Enable TU

Select from one of the following options:

- If this DIU is receiving a TT input from a data port, then enter **Y** for the port with the TT signal. Enter **N** for all other ports of all other DIUs in the node. This is necessary because only one bus is available to carry this clock, and more than one clock source on the bus causes a synchronization conflict.
- If **Enable TU =** , the timing mode is called *data equipment timing*. Its application depends on how the connected CSU timing is configured.
- For T1-mux applications, configure the **CSU: DIU Timing = DIU**; then TT is the timing source for the CSU.
- For drop-and-insert, configure **DIU Timing = TU**; then TT is the timing source for the TIU.
- If you use any other DIU timing mode, enter **N** for all ports.

DIU 2140 Configuration

The **DIU 2140 Options** screen shows the configuration options for the first DIU 2140 in the specified range.

Figure 5-17 DIU 2140 Option Menu

```
AS2000 Options for DIU 2140 Edit Shelf=1 PLUG=3 [1...13]

Installed and Operational.....? Y
Save Configuration to DIU.....? Y
Connected CSU shelf #.......... 1  plug #.... 1
Channel Assignment........[F8]. 2
Mode.....................[F8]. DS0B

Port  Baud Rate  Async          EQP Name                    EQP SER.

  1   9600         Y
  2   0            Y
  3   0            Y
  4   0            Y
  5   0            Y

          Press F5 to update element, F8 for Options/Baud Rate
          Ctrl-PgUp / Ctrl-PgDn for prev/next circuit element
```

Installed and Operational

This setting should be the same as the **`Installed and Operational`** option setting for the associated CSU.

Save Configuration to DIU

To store the configuration from the database into the DIU, set the **`Save configuration to DIU`** option to **`Y`**. If this option is set to **`N`**, any updated changes are saved to the database but are not downloaded to the DIU.

Connected CSU Shelf and Plug Numbers

Specify the AS2000 shelf number and plug-in module slot number of the CSU associated with the selected DIU 2140. The shelf number can be from 1 to 4. The plug-in module slot number can be from 1 to 13 for a multiline shelf or 1 to 2 for a dual-line shelf.

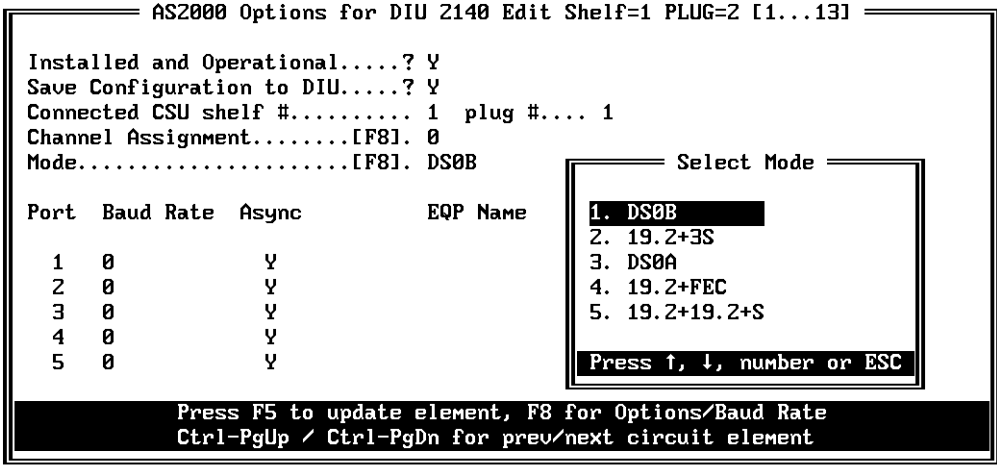
Channel Assignment

Assign an available DS0 channel of the associated DS1 line to the DIU. This number can be from 1 to 24.

This parameter also has an (F8) key associated with it so that you can view the allocated channels. For additional information, see "Channel Assignment" on page 5 -93.

Mode

To select the transmission mode of the DIU 2140, press (F8) in the **`Mode`** field. The *Select Mode* screen will appear.


AS2000 Options for DIU 2140 Edit Shelf=1 PLUG=2 [1...13]
Installed and Operational.....? Y
Save Configuration to DIU.....? Y
Connected CSU shelf #..... 1 plug #.... 1
Channel Assignment.....[F8]. 0
Mode.....[F8]. DS0B
Port Baud Rate Async EQP Name
1 0 Y
2 0 Y
3 0 Y
4 0 Y
5 0 Y
Select Mode
1. DS0B
2. 19.2+3S
3. DS0A
4. 19.2+FEC
5. 19.2+19.2+S
Press ↑, ↓, number or ESC
Press F5 to update element, F8 for Options/Baud Rate
Ctrl-PgUp / Ctrl-PgDn for prev/next circuit element

Each mode determines which data ports are to be used. The total (aggregate) data rate for each DIU 2140 cannot exceed 48 kbps. Set the DIU 2140 mode to one of the following, then press its corresponding number key to select the setting and return to the *DIU 2140 Options* Menu.

DS0B This mode allows subrate data to be transmitted on all five ports of the DIU. In the *DS0B* transmission mode, each port operates at 0.3, 0.6, 1.2, 2.4, 4.8, or 9.6 kbps, or the five ports may operate in any combination of these rates. The signals are multiplexed into one data signal and transmitted over the DS1 network on the assigned DS0 channel slot. After selecting *DS0B* mode, also set the data rate individually for each data port. See “Baud Rate” on page 5-101.

19.2 + 3S Use this mode to transmit 19.2 kbps data on Port 1 and subrate data of 9.6 kbps or less on Ports 2, 3, and 4. When this option is chosen, the data rate for Port 1 is automatically entered as 19.2 kbps in the BAUD RATE column, and the rates for the other ports must be specified individually (in “Baud Rate” on pa ge5-101). Also, data Port 5 of the DIU is not available for use if this mode is chosen. The DS0B channels are assigned as follows:

Port 1 = Channels1 and 2
Port 2 = Channel 3
Port 3 = Channel 4
Port 4 = Channel 5.

DS0A Use this mode to transmit subrate data on data Port 1. The rate on this port can be 0.3, 0.6, 1.2, 2.4, 4.8, or 9.6 kbps. After selecting DS0A, also set the data rate individually for data Port 1. Ports 2 through 5 are not available if the DS0A mode is selected. In this mode, the data is repeated enough times to fill the 48 kbps payload.

19.2 + FEC Use this mode to transmit data on a 19.2 kbps port with forward error correction (FEC). In this mode, Port 1 is used for transmission with error correction according to AT&T Publication 54075. Ports 2 through 5 are not used in this mode.

19.2 + 19.2 + S Use this mode to transmit 19.2 kbps on EQP Ports 1 and 2 and subrate data of 9.6 kbps or less on Port 3. In this mode, Ports 4 and 5 are not available. When this mode is chosen, the rates for Ports 1 and 2 are automatically entered in the **`Baud Rate`** column of the *DIU 2140 Configuration* Menu and you must specify the desired subrate for Port 3 as described in "Baud Rate" on page 5-101. The DS0B channels are assigned as follows:

Port 1 = Channels 1 and 2
Port 2 = Channels 3 and 4
Port 3 = Channel 5
Ports 4 and 5 are not used.

Baud Rate

After choosing the data transmission mode option above, specify the data rate for each data port as required. The rates for some of the ports may already be entered, depending on which mode was chosen above. Generally, you must specify the rate whenever a data port transmits subrate data at 9.6 kbps or less.

Asynchronous

Set this option to **YES** for each data port operating in the asynchronous transmission mode, or set it to **`NO`** if synchronous transmission is used.

Each DIU 2140 can have any combination of asynchronous and synchronous data equipment connected to it.

DIU Configuration Error Messages

If you see an error message when you press F5 to store and download your DIU settings, the message indicates that the settings you have chosen are invalid. One of the following error messages may appear:

- `TOO MANY DIU CONFIGURED` appears if you assigned more than 24 total DS0s to the same NCC 2020 (CCC 1020) or TAC 2010 (TAC 1010).
- `DUPLICATE CHANNEL ASSIGNMENT` appears if you assigned a channel of a DS1 line to a DIU data port and that channel was previously assigned to another DIU or data port.
- `SUM OF THE BAUD RATES EXCEEDS SYSTEM MAXIMUM (48000)` appears if the sum of the data port baud rates assigned to a DIU 2140 exceeds the maximum aggregate rate of 48 kbps.
- `INVALID PORT xxx BAUD RATE` appears when the baud rate (xxx) you entered is not valid for the mode of operation selected.

Configuring circuits

This section describes how to add, edit, delete, view, and list circuit definitions. The following subsections will show you how to arrive at the appropriate screens for the procedure you wish to execute. All fields within each screen are described in the order they appear (from top to bottom).

A *circuit* is defined as two CSUs (Channel Service Units) and the connecting DS1 facilities between each element accessed by Access Manager. If a network circuit is only an end section and does not have a far-end CSU (for example, a network circuit that terminates in a DACS or ESS switch), then an Access Manager circuit cannot be built for the network circuit.

If you change the node name in the node definition, that change in name is not automatically made in the circuit and route definitions that include that node. This creates problems during database analysis by circuit and on-line element status; furthermore, in polling the far-end, data might not be stored properly

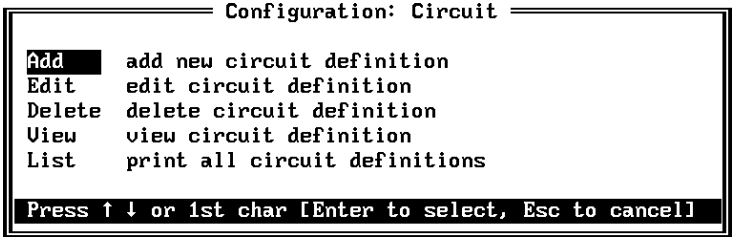
If you ever edit a circuit or route with a changed node name, then the node name must be updated before Access Manager recognizes the node and accepts the changes to the circuit/route definition.

Defining a new circuit

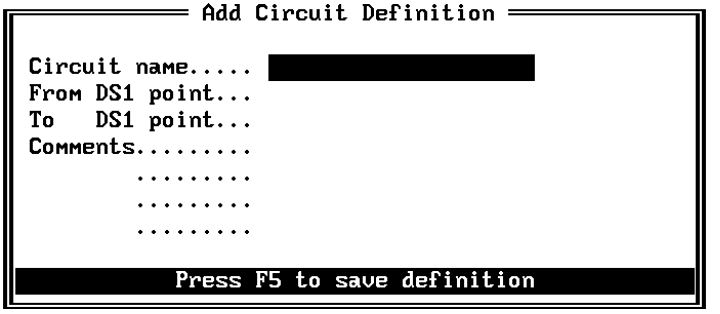
Before you can define a circuit, you must already have defined the nodes and circuit elements at each end of the circuit. If you have questions, refer to the configuration steps defined in "Summary of tasks" on page 5 -5.

To define a new circuit:

1. At the *Main Menu*, type **C** to bring up the *Configuration* Menu.
2. Then, type **C** to select **Revise Circuit Definitions**. The *Configuration: Circuit* screen of now appears.


Configuration: Circuit
Add add new circuit definition
Edit edit circuit definition
Delete delete circuit definition
View view circuit definition
List print all circuit definitions
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

3. From the *Configuration: Circuit* screen, type **A** to bring up the *Add Circuit Definition* screen.



4. When you have finished entering the circuit definition, press the F5 key to accept your entries. After the database has been updated, you are returned to the *Add Circuit Definition* screen.

Circuit Name

In the *Add Circuit Definition* screen, type in the circuit name. The name can be either the circuit number or a brief description of the circuit itself. The choice is up to you, so long as the name you select does not exceed twenty alphanumeric characters.

From DS1 Point

The next option is the **`From DS1 Point`** entry, which is used to define a circuit element. This must include the node name exactly as it is spelled in the node definition, and it must also must include any other information needed to define a single circuit element. Otherwise, an error message appears indicating a non-existent node or lack of sufficient parameters. The node name is sufficient to define a single-line CS circuit element.

All multiline CSUs, except a node identified as an AS2000, ConnecT1 Plus, or NC/E, require a single parameter after the node name to define the circuit element.

The AS2000 and NC/E require two additional parameters after the node name. The first parameter defines the 551VST MLS Shelf (1 to 5), and the second defines the 4016-R CSU (from 1 to 10) within each shelf.

The other parameters needed to define individual circuit elements in multiline CSUs are surrounded by square brackets: [c] for SIM, 551VST ML List 1 and 551VST ML List 2 nodes, and [s,c] for AS2000, ConnecT1 Plus, or NC/E nodes, where c = slot number in the multiline shelf and where s = shelf number accessed through an AS2000, ConnecT1 Plus, or NC/E node.

When entering circuit element parameters, you are not required to enter the brackets.You can use a comma between the node name and the first parameter instead; if so, when you press the **F5** key to accept the parameters, the system automatically encloses them within brackets. Notice that twenty-two (22) is the maximum number of characters allowed for defining a circuit element with its parent node.

To DS1 Point

Enter the **`To DS1 Point`** using the node name exactly as you would when entering the **`From DS1 Point`** option described above.

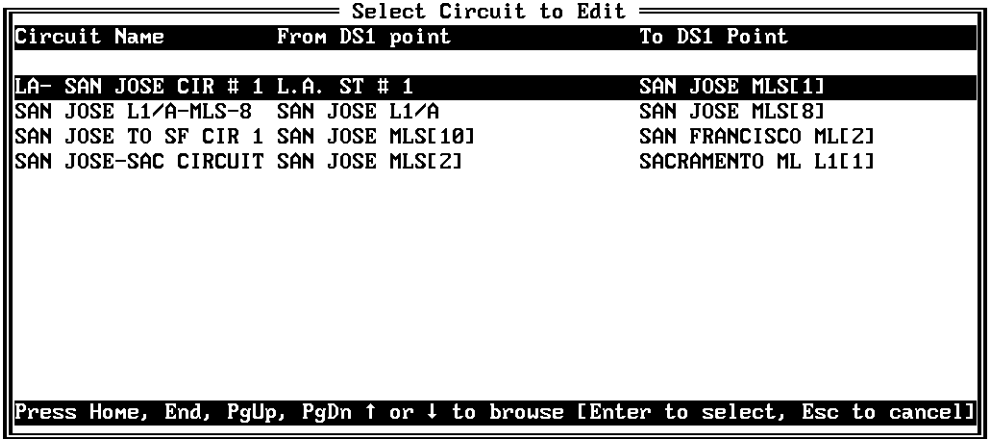
Comments

You can add up to four lines of comments, with up to thirty characters allowed on each line. The first line should describe the circuit because this line appears in the description column during circuit selection.

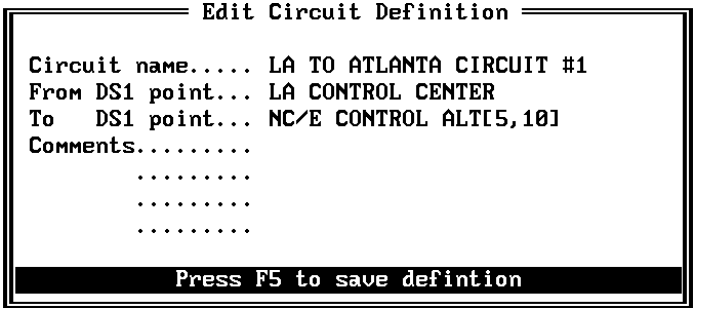
Editing a circuit definition

Once your circuits are defined, you can change them with the **`Edit Circuit Definition`** option. From the *Configuration* Menu, proceed as follows:

1. Type **`E`** to select **`Edit Circuit Definition`**.. The *Select Circuit to Edit* screen appears, along with the first page of circuits.


Select Circuit to Edit
Circuit Name From DS1 point To DS1 Point
LA- SAN JOSE CIR # 1 L.A. ST # 1 SAN JOSE MLS[1]
SAN JOSE L1/A-MLS-8 SAN JOSE L1/A SAN JOSE MLS[8]
SAN JOSE TO SF CIR 1 SAN JOSE MLS[10] SAN FRANCISCO ML[2]
SAN JOSE-SAC CIRCUIT SAN JOSE MLS[2] SACRAMENTO ML L1[1]
Press Home, End, PgUp, PgDn ↑ or ↓ to browse [Enter to select, Esc to cancel]

2. Use the directional keys to reach the circuit you wish to edit. After positioning the cursor on that circuit, press (Enter) to display the *Edit Circuit Definition* screen for that circuit.



3. Make any required changes as described in the **`Adding a Circuit Definition`** section above.

4. Press F5 to accept the changes or F2 to cancel editing.

CAUTION

If you edit a circuit or route with a changed node name, that name must be updated before Access Manager will recognize the node and accept the changes to the circuit/route definition.

Deleting a circuit definition

A circuit can be deleted from the database at any time.

1. In the *Configuration: Circuit* screen, type **D** to select **Delete Circuit Definition**. The *Select Circuit to Delete* screen appears, along with the first page of circuits.
2. Use the directional keys to position the cursor on the circuit you want to delete.
3. Press (Enter). You are asked to confirm that you want to delete the selected circuit by typing **Y**. Any other response aborts the deletion.

Viewing a circuit definition

You can view a circuit definition without changing it by selecting the **View** option.

1. In the *Configuration: Circuit* screen, type **V** to select **View Circuit Definition**. The *Select Circuit to View* screen appears, along with the first page of circuits.
2. Use the directional keys to position the cursor on the circuit you want to view.
3. To display the detailed circuit definition, press (Enter).

List all circuit definitions

A list of all circuit definitions can be printed using the **List** option.

1. In the *Main Menu*, type **C** to select the **Configuration: Circuit** Menu.
2. In that menu, type **L** to select **Print All Circuit Definitions**, and the circuit definitions will be printed.

Configuring routes

Although screens have been created for connecting circuits by configuring routes, routes have not been implemented in Access Manager software.

Therefore, we have removed any references to routes from this manual.

CSU acceptance testing

Before performing the CSU acceptance tests from an Access Manager 2000 PC, verify the following:

- ☐ The Access Manager 2000 PC is powered up, started, and ready for operation.
- ☐ The Access System 2000 node definitions are already entered in the Access Manager 2000 database.
- ☐ The CSU of each NCC or TAC to be tested is configured.
- ☐ If the Access Manager 2000 PC interfaces with the Access System 2000 over a modem or multiplexer, the node to be tested has already been auto-configured for modem or multiplexer communication.

To perform the CSU acceptance tests from an Access Manager 2000 PC, proceed with the following steps.

Note: *These tests use the CSU repeater loopback (RLB) function. The RLB remains active until the operator-defined time-out period ends. For test purposes, you can temporarily change this interval from an Access Manager 2000 PC. The default RLB time-out setting is one minute.*

1. ☐ Start up the Access Manager 2000 PC and log in by entering the proper user name and password. A user level of 4 is required for these tests. Also verify that the current Access Manager 2000 software revision is 2.3B or higher. This revision appears at the bottom of the *Main Menu*.
2. ☐ Access the CSU to be tested and temporarily set the repeater loopback (RLB) time-out option of each CSU to be tested to **`1 HR`**.
3. ☐ Starting from the Main Menu of Access Manager 2000, select **`On-line Access`**. The *On-line Access (Select Node) Menu* appears.
4. ☐ Select the Access System 2000 node in which the desired NCC or TAC is located and press **Enter**. The *On-line: AS2000* screen appears.

5. Choose the **Loopbacks** option and press Enter.
6. Type the shelf and plug (plug-in module slot) numbers of the NCC or TAC, and press the F5 function key.
7. Choose the **Activate Repeater Loopback (RLB)** option and press Enter.
8. Type **N** to specify the near-end RLB and press Enter.
9. When the loopback warning screen appears, type **Y** to activate the loopback.
10. Press Enter to return to the *On-line: AS2000* screen.
11. Choose the **Select Test** option and press Enter.
12. Type shelf and plug-in slot numbers of the NCC or TAC, and press the F5 function key. The *Select CSUTest Activity* screen appears.
13. Choose the **Send QRSS Test Pattern** option and press Enter. The *Test Current Node* screen appears. Enter the following settings and press:
    - **Test Duration: FOREVER**
    - **To Network or Equipment: N (Network)**
    - **Test From Far End: N (No)**
14. Type **Y** to send the test signal when the test warning screen appears. The *Select CSUTest Activity* screen appears again.
15. Verify that the EQP and STAT LEDs are both lit yellow on the near-end NCC orTAC. The RLB is activated and the test is in progress.

Note: *If the STAT LED flashes red and yellow, the test has failed (CSU is detecting errors in the looped QRSS signal). Replace the NCC or TAC.*

16. Select the **View Test Status Results** option. If the screen shows some errors, the CSU test has failed. Replace the NCC or TAC.

17. Press Enter to return to the *Select CSUTest Activity* menu, then select the **Abort Test in Progress** option and press Enter.

18. Press Enter to return to the *On-line: AS2000* menu.

19. Choose the **Loopbacks** option and press Enter.

20. Type the shelf and plug-in slot numbers of the NCC or TAC, and press the F5 function key.

21. Choose the **Deactivate EQP Loopback (ELB and RLB)** option and press Enter.

22. Type **N** to specify the near-end RLB and press Enter.

23. Choose the **Activate Line Loopback (LLB)** option and press Enter.

24. Type **Y** to specify the far-end LLB and press Enter.

25. Type **Y** to activate the LLB when the loopback warning screen appears. At the far-end NCC or TAC, also verify that the NET LED is solid yellow (LLB is activated).

26. Press Enter to return to the *On-line: AS2000* screen.

27. Choose the **Select Test** option and press Enter.

28. Enter the Shelf number and Plug slot number of the NCC or TAC and press the function key. The *Select CSUTest Activity* Menu appears.

29. Choose the **Send QRSS Test Pattern** option and press Enter. The *Test Current Node* screen appears. Enter the following settings and press Enter.

    - **Test Duration: FOREVER**
    - **To Network or Equipment: N (Network)**
    - **Test From Far End: N (No)**

30. Type **Y** to send the test signal when the test warning screen appears. The *Select CSUTest Activity* screen appears again.

31. Verify that the STAT LED is lit yellow on the near-end and far-end CSUs (NCC or TAC), indicating that the test is in progress.

    If the STAT LED flashes red and yellow at either end, the test has failed (CSU is detecting errors in the looped QRSS signal). Check the T1 circuit between the two CSUs. The source of the failure is either in the circuit between the CSUs or in either CSU. Replace the CSUs and re-route the circuit as required, then repeat the acceptance testing procedure.

32. Select the **`View Test Status Results`** option. If the screen shows some Errors, the test has failed. Check the T1 circuit between the two CSUs.

33. Press (Enter) to return to the *Select CSUTest Activity* screen, then select the **`Abort Test in Progress`** option and press (Enter).

34. Press (Enter) to return to the *On-line: AS2000* screen.

35. Choose the **`Loopbacks`** option and press (Enter).

36. Type the shelf and plug numbers of the NCCor TAC and press the function key.

37. Choose the **`Deactivate Network Loopback (PLB and LLB)`** option and press (Enter).

38. Type **`Y`** to specify the far-end network loopbacks and press (Enter).

39. Choose the **`Activate PLB`** option and press (Enter).

40. Type **`Y`** to specify the far-end payload loopback (PLB), and press (Enter).

41. Type **`Y`** to activate the PLB when the loopback warning screen appears. At the far-end NCC or TAC, also verify that the NET LED is solid yellow (PLB is activated).

42. Press (Enter) to return to the *On-line: AS2000* screen.

43. Choose the **`Select Test option`** and press (Enter).

44. Type the shelf and plug-in slot numbers of the NCC or TAC, and press the F5 function key. The *Select CSUTest Activity* menu appears.

45. Choose the **Send QRSS Test Pattern** option and press Enter. The *Test Current Node* screen appears. Enter the following settings and press Enter:

    - **Test Duration: FOREVER**
    - **To Network or Equipment: N (Network)**
    - **Test From Far End: N (No)**

46. Type **Y** to send the test signal when the test warning screen appears. The *Select CSUTest Activity* menu appears again.

47. Verify that the STAT LED is lit yellow on the near-end and far-end CSUs (NCC or TAC), indicating the test is in progress.

    If the STAT LED flashes red and yellow at the far-end, the test has failed (CSU is detecting errors in the looped QRSS signal). Replace the far-end NCC orTAC and repeat the acceptance procedure. (The near-end NCC or TAC and the T1 circuit were checked in the previous steps, using the LLB loopback of this procedure.)

48. Select the **View Test Status Results** option. If the screen shows some Errors, the test has failed. Replace the far-end NCC or TAC and repeat the acceptance procedure. (The near-end NCC or TAC and the DS1 circuit were checked in the previous steps, using the LLB loopback of this procedure.)

49. Press Enter to return to the *Select CSUTest Activity* screen, then select the **Abort Test in Progress** option and press Enter.

50. Press Enter to return to the *On-line: AS2000* screen.

51. Choose the **Loopbacks** option and press Enter.

52. Enter the Shelf number and Plug slot number of the NCC or TAC, and press the F5 function key.

53. Choose the **Deactivate Network Loopback (PLB and LLB)** option and press Enter.

54. Type **Y** to specify the far-end Network Loopbacks and press Enter.

55. Repeat this procedure for each remaining NCC and TAC to be tested.

56. This procedure is complete. The NCCs and TACs are now ready for operation.

Chapter

6

Alarm reporting

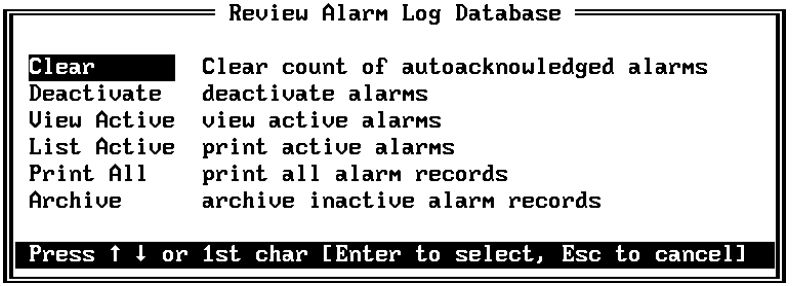
This chapter gives you instructions for performing the operations that handle the Alarm Log. These operations are:

- Clearing
- Deactivating
- Viewing
- Printing
- Archiving
- Deleting alarm records from the alarm log

These operations are performed from the **Alarm Status** option of the *Main Menu*.

To get to the Alarm Status screen:

- Starting from the *Main Menu*, select **Alarm Status**. The *Alarm Status (Review Alarm Log Database)* screen appears.



Clearing the autoacknowledged alarm counte

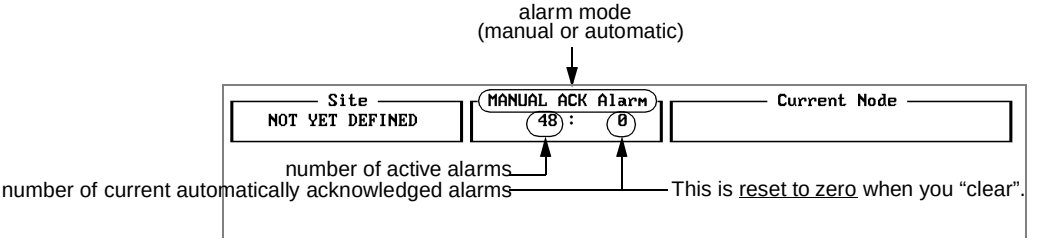
In this section, **Clear** means to reset the auto-acknowledged alarms counter to zero. It is important to note that clear is referred to in other

sections of this manual to describe a trouble condition that no longer exists.

To reset the auto-acknowledged alarms counter to zero:

1. Starting from the *Main Menu*, select **`Alarm Status`**. The *Alarm Status (Review Alarm Log Database)* screen appears.

2. From this screen, select **`Clea`** . The automatic acknowledge counter at the top of the screen to the right of the colon (:) is now reset to zero, without displaying additional menus or confirmation messages.



Selecting **`Clear`** does not affect the alarm reports in the alarm log.

Deactivating alarms

To deactivate alarms:

1. Starting from the *Main Menu*, select **`Alarm Status`**. The *Alarm Status (Review Alarm Log Database)* screen appears.

2. From this screen select **`Deactivate`**. The *Deactivate (Select Alarm to Deactivate)* screen appears.

```
                    Select Alarm to Deactivate
Alarm from                  Alarm Time Stamp  First Alarm Condition

NAME OF NODE[1,1]       01/23/92 11:52:14 Near Net LOF alarm cleared
NAME OF NODE[1,1]       01/23/92 11:52:27 Near Eq. Low Density alarm
NAME OF NODE[1,1]       01/23/92 11:52:29 Near Eq. LOF alarm
NAME OF NODE[1,1]       01/23/92 11:52:36 Near Net LOF alarm
NAME OF NODE[1,1]       01/23/92 11:52:37 Near Eq. Low Density alarm clear
NAME OF NODE[1,1]       01/23/92 11:52:53 Near Net LOF alarm cleared
NAME OF NODE[1,1]       01/23/92 11:52:53 Near Eq. LOF alarm cleared
NAME OF NODE[1,1]       01/23/92 11:54:20 Near Net BER exceeded cleared
NAME OF NODE[1,2]       01/23/92 11:55:55 Near Plug Absent alarm
NAME OF NODE[1,1]       01/23/92 12:15:09 Near Net UAS exceeded cleared
NAME OF NODE[1,1]       01/23/92 12:15:09 Near Eq. UAS exceeded cleared
   Press Home, End, PgUp, PgDn ↑ or ↓ to browse, + to tag, - to untag,
  F8 to specify date and time range [Enter to deactivate, Esc to cancel]
```

3. You may now proceed to tag or select alarm records and deactivate them.

See the following *Tagging Alarm Records for Deactivation* and *Selecting Alarm Records by Date and Time to Deactivate* sections.

Alarm records are saved in the alarm log by Access Manager. The alarm records are either Active or Deactivated. Deactivate only those alarm records that you have determined are no longer present and that you want to delete from the active alarm log.

CAUTION

The *Deactivate* option allows you to remove alarm records (that is, reports) from the alarm log whether or not the trouble condition tha caused it has ended. Check the alarm records log for the corresponding cleared record, and check the On-line condition of the circuit element before deactivating an alarm record. Select the *Deactivate* option by typing "D" in the *Review Alarm Log Database* screen.

Tagging Alarm Records for Deactivation

To tag alarm records for deactivation:

1. Starting from the *Main Menu*, select **`Alarm Status`**. The *Alarm Status (Review Alarm Log Database)* screen appears.

2. From this screen, select **`Deactivate`**. The *Select Alarm to Deactivate* screen appears. Follow these steps to tag and deactivate alarm records.

3. Notice that the cursor is positioned on the left side of the menu, initially beside the last alarm record. Move the cursor to the first alarm you wish to deactivate. Press (Shift) (-) to deactivate the alarm.

4. Move the cursor to the next alarm record you wish to deactivate and press (Shift) (-) to deactivate the alarm.

5. Continue the process for each alarm record to be deactivated. To remove a tag from an alarm record, press the "hyphen" key. The screen response in this option can be slow if the number of active or deactivated alarms is large.

6. Verify that the correct alarm records are tagged for deactivation. Tagged alarm records are indicated on the screen by an intensified background for that alarm record in the color mode. In monochrome mode, the tagged alarm records are shown in black on a white background.

7. Press (Enter) to deactivate the selected alarm reports, or press (F2) to abort deactivation.

8. If you pressed (Enter), a prompt appears, asking you to confirm that you want to deactivate the selected alarms. To deactivate the alarms, type **Y**. Pressing any other key cancels deactivation of the selected alarms.

9. If you wish to deactivate additional alarm records by selecting a date and time range, follow the instructions on the next section.

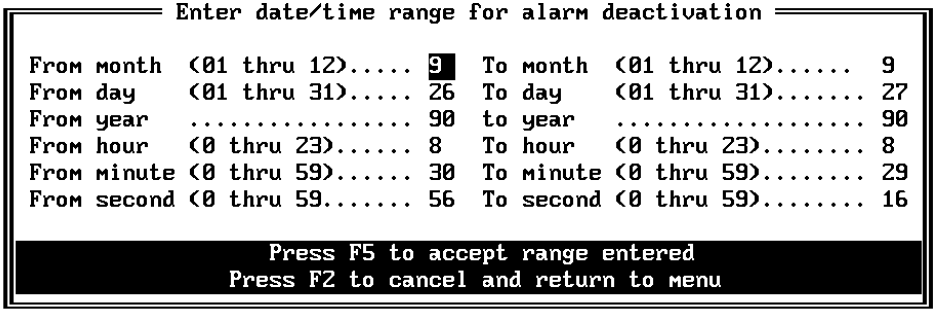
Selecting Alarm Records by Date and Time for Deactivation

To deactivate alarm records by date and time:

1. Starting from the *Main Menu*, select **`Alarm Status`**. The *Alarm Status (Review Alarm Log Database)* screen now appears.

2. From this screen, select **`Deactivate`**. The *Deactivate (Select Alarm to Deactivate)* screen now appears. Follow these steps to select a date and time range through which alarm records are deactivated.

3. Press (F8). The *Enter Date/Time Range for Alarm Deactivation* screen appears.


Enter date/time range for alarm deactivation
From month (01 thru 12)..... 9
To month (01 thru 12)..... 9
From day (01 thru 31)..... 26
To day (01 thru 31)..... 27
From year 90
to year 90
From hour (0 thru 23)..... 8
To hour (0 thru 23)..... 8
From minute (0 thru 59)..... 30
To minute (0 thru 59)..... 29
From second (0 thru 59..... 56
To second (0 thru 59)..... 16
Press F5 to accept range entered
Press F2 to cancel and return to menu

The date and time range is displayed from the oldest alarm record in the database to the current time. Change the date and time to the range you want to deactivate.

4. To select all the alarms within the range entered, press the (F5) key. Or, press (F2) to abort.

5. To deactivate the alarm reports in the selected range, press (Enter). Or, press (F2) to abort deactivation.

6. If you pressed (Enter), a prompt appears, asking you to confirm that you want to deactivate the selected alarms. To deactivate the alarms, type **Y**. Pressing any other key cancels deactivation of the selected alarms.

Note: *The alarm records selected by date and time are not shown on the screen as they were in the preceding Tagging Alarm Records for Deactivation section.*

Viewing active alarms

To view active alarms:

1. Starting from the *Main Menu*, select **`Alarm Status`**. The *Alarm Status (Review Alarm Log Database)* screen appears.

2. From this screen, select **`View Active`**. The *View (Select Alarm to View)* screen appears.

3. Move the cursor to an alarm record you wish to view, and press Enter. If more than one alarm condition is stored in the record, the *View Alarm* screen lists them.

```
                              View Alarm

Time Stamp....... 01/23/1992 10:09:00
Node Name........ NEW YORK SALES
Node ID.......... 1
Equipment Type... CONNECT1 PLUS
Shelf number..... 1
Unit number...... 1
Alarms........... Near Eq. UAS exceeded cleared
      ........... Far LLB or PLB looped
      ........... Near BER exceeded
      ...........
      ...........
      ...........
      ...........
      ...........
      ...........
      ...........
      ...........
      ...........

                          Press F2 to return
```

4. Use this option to view active alarm records (that is, reports) from 551VST type circuit elements before deactivating them.

   When you acknowledge an alarm message from a 551VST type circuit element, there may be more than one condition causing that message. The *View Alarm* screen lists all the conditions that were reported in one message for that circuit element.

   The alarm **`Time Stamp`** for 551VST type circuit elements is the time the alarm report is received by Access Manager.

The **`Alarm Time Stamp`** for AS2000 and 551VST type circuit elements (hardware) is the time the alarm report is detected by the AS2000 type node (if AS2000 CSU is near-end).

It is important to note that the AS2000 type node's date/time clock is synchronized to Access Manager's clock every time the node is polled. Therefore, if the node is not set for polling, the date/time clocks stamps in its reports may be invalid.

Note: *The screen response in this option can be slow if the number of active or deactivated alarms is large.*

Listing active alarms

The **`List Active`** option prints a list of active alarm records to the report printer

To print a list of active alarm records to the report printer:

1. Starting from the *Main Menu*, select **`Alarm Status`**. The *Alarm Status (Review Alarm Log Database)* screen appears.
2. From this screen, select **`List`**. The active records will be sent to the report printer

Printing all alarms

The **`Print All`** option prints all the alarm records, including the deactivated alarm records, to the report printer.

To print all alarm records to the report printer:

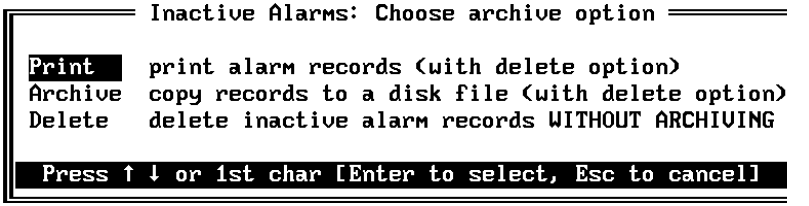
1. Starting from the *Main Menu*, select **`Alarm Status`**. The *Alarm Status (Review Alarm Log Database)* screen appears.
2. From this screen, select **`Print`**. The active records will be sent to the report printer

Archiving inactive alarms

To archive inactive alarm records:

1. Starting from the *Main Menu*, select **`Alarm Status`**. The *Alarm Status (Review Alarm Log Database)* screen appears.

2. From this screen, select **`Archive`**. A screen labeled *(Inactive Alarms: Choose Archive Option)* appears.


Inactive Alarms: Choose archive option
Print
print alarm records (with delete option)
Archive
copy records to a disk file (with delete option)
Delete
delete inactive alarm records WITHOUT ARCHIVING
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

Four options are available for deactivated alarms:

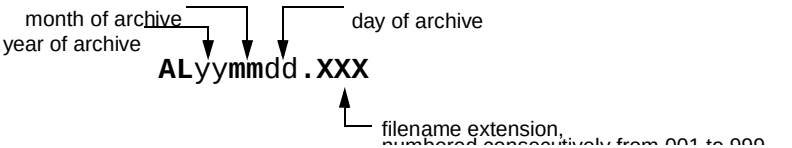
- The **`Archive`** option copies deactivated alarm records to a disk file.
- The **`Print`** option prints active and deactivated alarm records.
- The **`Archive (List)`** option prints deactivated alarm records.
- The **`Delete`** option deletes deactivated alarm records without copying or printing.

Alarm Log Record format

The archived alarm log records are in a format compatible with:

- Lotus 1-2-3 or similar spreadsheet file formats
- dBase III Plus or similar database file formats

The format uses a comma-delimited ASCII record format. The maximum file size is 65 kilobytes. If necessary, multiple files are created and identified by the file name extension. The filename format is



Note: *The month, date, and year used in the archive file name are those selected in the Archive Cutoff Date screen, not the current date.*

The archive process always creates files starting with extension **001**. If you have performed previous alarm log archives with the same cutoff day the existing archive file(s) are overwritten if they are on the same disk drive and directory. Refer to Appendix E "Archive File Formats" for the alarm archive record format.

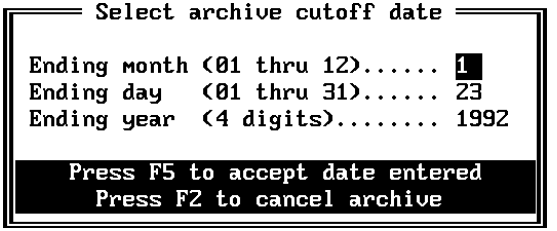
Deleting inactive alarms

The **Delete** option removes inactive (i.e., deactivated) alarm records from the database (i.e., log) without saving them.

If you wish to save the records before removing them from the database, choose the **Archive Inactive Alarms** option instead.

To delete inactive alarms:

1. Starting from the *Main Menu*, select **Alarm Status**. The *Alarm Status (Review Alarm Log Database)* appears.
2. From this screen, select **Archive**. The *Archive (Inactive Alarms: Choose Archive Option)* screen appears.
3. From this screen, select **Delet** . The *Select Archive Cutoff Date* screen appears.


Select archive cutoff date
Ending month (01 thru 12)..... 1
Ending day (01 thru 31)..... 23
Ending year (4 digits)..... 1992
Press F5 to accept date entered
Press F2 to cancel archive

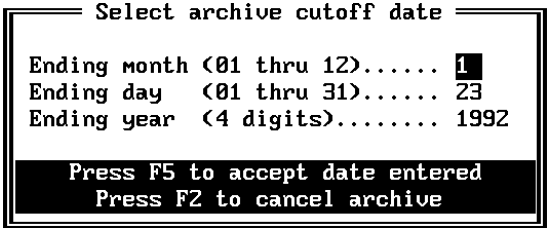
4. Enter the date of the last alarm record you want deleted.
5. To delete the deactivated alarm reports in the selected range, press F5 . Or, press F2 to abort deletion.
6. If you pressed F5 , a prompt appears, asking you to confirm that you want to delete the selected alarm records.

- To delete the alarm records, type **Y**.
- To cancel deletion of the selected alarm records, press any other key.

Printing inactive alarms

To print inactive alarms:

1. Starting from the *Main Menu*, select **`Alarm Status`**. The *Alarm Status (Review Alarm Log Database)* screen appears.
2. From this screen, select **`Archive`**. The *Archive (Inactive Alarms: Choose Archive Option)* screen appears.
3. From this screen, select **`Print`**. The *Select Archive Cutoff Date* screen appears.


Select archive cutoff date
Ending month (01 thru 12)..... 1
Ending day (01 thru 31)..... 23
Ending year (4 digits)..... 1992
Press F5 to accept date entered
Press F2 to cancel archive

4. Enter the date of the last alarm record you want printed.
5. Press F5 to print the deactivated alarm reports in the selected range, or press F2 to abort printing.
6. If you pressed F5, a prompt appears, asking you to confirm that you want to delete the selected alarm records.
   - To delete the alarm records, type **Y**.
   - To cancel deletion of the selected alarm records, press any other key .

Note: *The* **`Print`** *option prints the inactive alarm records (i.e., reports) to the report printer and gives you the option of deleting the deactivated alarm records after they are printed.*

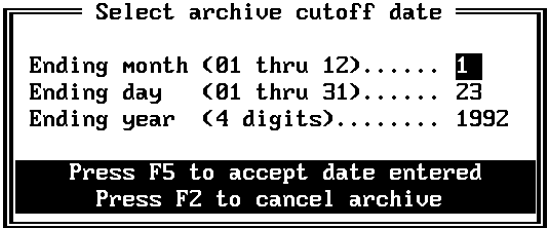
Archiving inactive alarms

To archive inactive alarms:

1. Starting from the *Main Menu*, select **`Alarm Status`**. The *Alarm Status (Review Alarm Log Database)* screen appears.

2. From this screen, select **`Archive`**. The *Archive (Inactive Alarms: Choose Archive Option)* screen appears.

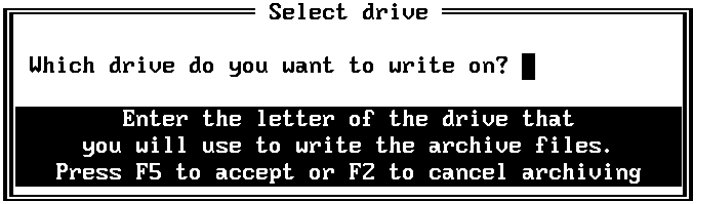
3. From this screen, select **`Archive`**. The *Select Archive Cutoff Date* screen now appears.


Select archive cutoff date
Ending month (01 thru 12)..... 1
Ending day (01 thru 31)..... 23
Ending year (4 digits)..... 1992
Press F5 to accept date entered
Press F2 to cancel archive

4. Enter the date of the last alarm record you want archived.

5. Press (F5) to archive the deactivated alarm reports in the selected range, or press (F2) to abort archiving.

6. If you pressed (F5), the **`Select Drive`** screen appears and prompts you to specify the disk where the file is to be written.


Select drive
Which drive do you want to write on?
Enter the letter of the drive that
you will use to write the archive files.
Press F5 to accept or F2 to cancel archiving

You can archive the alarm records to any drive installed in your system. If the drive selected is the drive on which Access Manager is running, the archived files are placed in the Access Manager database directory. If any other drive is selected, the files are placed in the root directory of that drive.

Enter the drive letter and press (Enter), or press (F2) to cancel archiving.

Note: *If the drive selected is the drive on which Access Manager is running, the archived files are placed in the Access Manager database directory. If any other drive is selected, the files are placed in the last previously selected directory of that drive.*

7. If you pressed **F5**, a prompt appears, asking you to confirm that you want to delete the selected alarm records.

   - To delete the alarm records, type **Y**.
   - To cancel deletion of the selected alarm records, press any other key .

Chapter

7

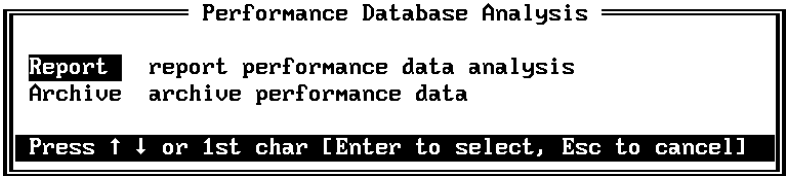
Analyzing Performance Data

This chapter gives you instructions for retrieving, analyzing, archiving, and deleting DS1 (T1) performance data that has been stored in the Access Manager 2000 PC by "polling" each CSU. Without polling, there is no data to analyze!

These operations are performed from the **Database Access** option of the *Main Menu*.

To get to the performance data:

- Starting from the *Main* Menu, select **Database Access**. The *Performance Database Analysis* screen appears.


Performance Database Analysis
Report report performance data analysis
Archive archive performance data
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

All performance data analysis operations are performed from this menu. It allows you to:

- obtain a database analysis report
- archive the data stored in the Access Manager database

Performance data can be analyzed from two perspectives:

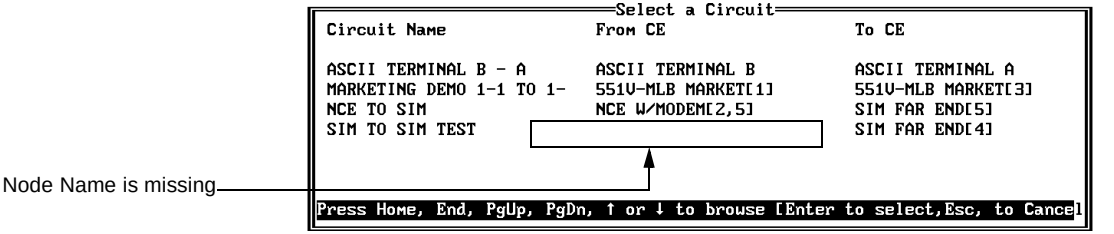
- a single node
- a circuit having two circuit elements

The analysis applies to data collected from the nodes and circuit elements on a scheduled basis over short or long periods of time, depending on how much data has been stored in the Access Manager database.

Effect of Changing a Node Name

When you change a node name with the *Node Configuration* screen, this change will not automatically carry over into the circuit definitions. Therefore, a valid analysis of the performance records of circuits cannot be performed.

You must change the node name individually in each circuit. If you don't, you will have missing or invalid configuration data, as shown below.



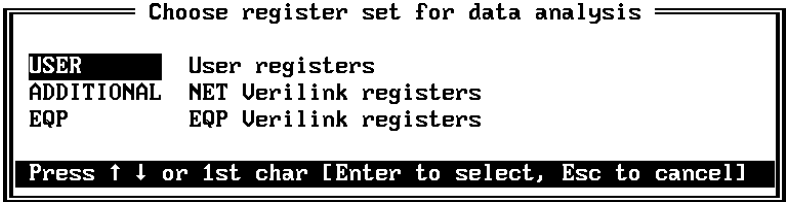
Be careful when trying to correlate database analysis over extended intervals. Changes to the node name and circuit definitions should be considered when setting the time and date ranges of the analysis.

Reporting performance data

To report performance data:

1. Starting from the *Main Menu*, select **`Database Access`**. The *Database Access(Performance Database Analysis)* screen appears.

2. From this screen, select **`Report`**. The following screen appears:



Use the procedures to select the performance data you want. You must begin with the first step in this procedure to ensure that the Performance Data Analysis Reports are compiled properly.

The Performance Data Analysis procedure is divided into thirteen steps. The steps are grouped into the following categories:

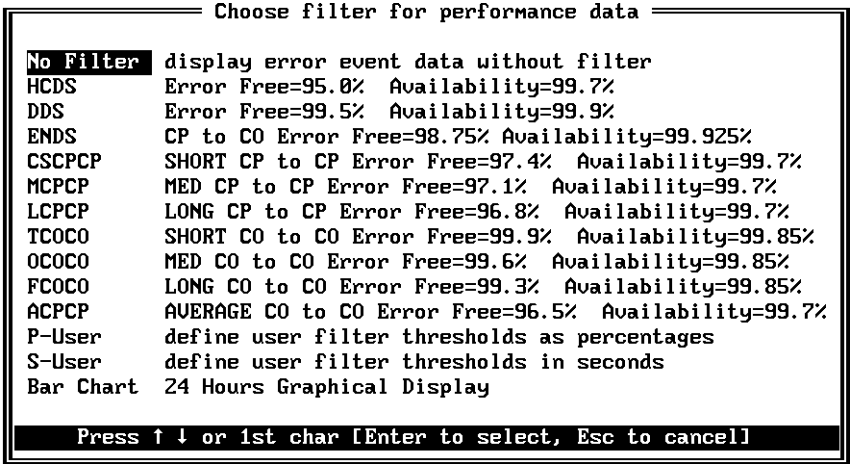
- Step 1 deals with selecting a register for data analysis.
- Steps 2 through 5 deal with choosing filters for the performance data.
- Steps 6 and 7 deal with setting the date and time range for the S-User or P-User filters.
- Steps 8 and 9 deal with choosing the network elements and circuits.
- Steps 10 through 12 deal with choosing performance data filters. distinction is made between the bar-chart analysis and other performance filters.
- Steps 13 through 15 deal with editing the performance data filter options.

Step 1 deals with selecting a register for data analysis.

1. Access Manager reports performance data as records that are stored in a log called the Performance Database. Access Manager collects DS1 performance data at 12-hour intervals and stores it in the log. The intervals are specified by the **`Performance Data Polling Hou`** . Telco registers are not stored in the Performance Database. The performance records are stored in one of three following registers:

   - **User:** Network side User Performance Data Registers. These registers are ES, UAS, BES, SES, LOFC, and ES-L. The SEFS register is included if the circuit element is a 551VST type. User Registers also include OOFS.
   - **Additional:** Additional Network side User Performance Data Registers. Only AS2000 type nodes have these registers. The registers are LOFS, LOSS, RAIS, AISS, BERS, and OOFS.
   - **EQP:** Equipment side User Performance Data Registers. Only AS2000 type nodes have these registers. The registers are ES, UAS, ES-L, OOFS, DTED, and DBER.

Move the cursor to **Use** , **Additional**, or **EQPT** and press Enter. The *Choose Filter for Performance Data* screen appears.


Choose filter for performance data
No Filter display error event data without filter
HCDS Error Free=95.0% Availability=99.7%
DDS Error Free=99.5% Availability=99.9%
ENDS CP to CO Error Free=98.75% Availability=99.925%
CSCPCP SHORT CP to CP Error Free=97.4% Availability=99.7%
MCPCP MED CP to CP Error Free=97.1% Availability=99.7%
LCPCP LONG CP to CP Error Free=96.8% Availability=99.7%
TCOCO SHORT CO to CO Error Free=99.9% Availability=99.85%
OCOCO MED CO to CO Error Free=99.6% Availability=99.85%
FCOCO LONG CO to CO Error Free=99.3% Availability=99.85%
ACPCP AVERAGE CO to CO Error Free=96.5% Availability=99.7%
P-User define user filter thresholds as percentages
S-User define user filter thresholds in seconds
Bar Chart 24 Hours Graphical Display
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

Steps 2 through 5 deal with choosing filters for the performance data.

2. If you selected **USER** on the *Choose register for data analysis* screen, all of the filters shown in the screen above are available to you.

   If you selected **ADDITIONAL** or **EQP** , only the **No Filter** and **Bar Chart** options are available.

3. Select the performance data analysis filter you want and press Enter.

   a. If you choose **P-Use** , continue with Step 4.

   b. If you choose **S-Use** , continue with Step 5.

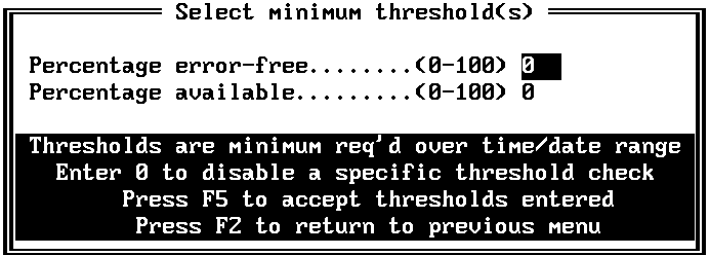
   c. If you choose other filters or the **Bar Chart** option, continue with Step 6.

   When you select a particular filter, you ask to see only that data which exceeds the filter's parameters. Base your selection on the following descriptions of the filters:

- **No Filter:** This option allows you to display all 15-minute intervals (within the selected time frame) which have been stored in the database, including the intervals for which data was not available when the circuit element was polled.
- **HCDS Filter:** High Capacity Digital Service (HCDS) filter performs data analysis based on the standard tariff of 95% error-free seconds and 99.7% availability.
- **DDS Filter:** This is equivalent to the DS1 line performance requirements for Digital Data Service (DDS*), which has an error-free seconds requirement of 99.5% and an availability of 99.9%.
- **ENDS:** Customer Premise (CP)-to-Central Office (CO), (access). This filter performs a 24-hour data analysis based on the standard tariff of 98.75% error-free seconds and 99.925% availability.
- **CSCPCP:** Customer Premise-to-Customer Premise (end-to-end) short circuit length (less than 250 airline miles). This filter performs a 24-hour data analysis based on the standard tariff of 97.4% error-free seconds and 99.7% availability.
- **MCPCP:** Customer Premise-to-Customer Premise (end-to-end) medium circuit length (250 to 1000 airline miles). This filter performs a 24-hour data analysis based on the standard tariff of 97.1% error-free seconds and 99.7% availability.
- **LCPCP:** Customer Premise-to-Customer Premise (end-to-end) long circuit length (more than 1000 airline miles). This filter performs a 24-hour data analysis based on the standard tariff of 96.8% error-free seconds and 99.7% availability.
- **TCOCO:** Central Office-to-Central Office (interoffice) short circuit length (less than 250 airline miles). This filter performs a data analysis based on the standard tariff of 99.9% error-free seconds and 99.85% availability.
- **OCOCO:** Central Office-to-Central Office (interoffice) medium circuit length (250 to 1000 airline miles). This filter performs a 24-hour data analysis based on the standard tariff of 99.6% error-free seconds and 99.85% availability.

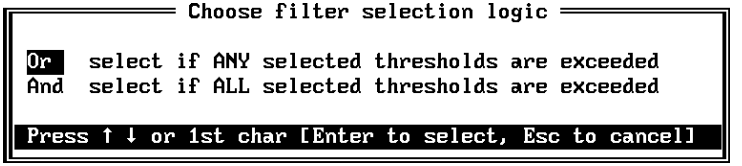
- **FCOCO:** Central Office-to-Central Office (interoffice) long circuit length (greater than 1000 airline miles). This filter performs a 24-hour data analysis based on the standard tariff of 99.3% error-free seconds and 99.85% availability.
- **ACPCP:** Average Customer Office-to-Customer Office (interoffice). This filter performs a 24-hour data analysis based on the standard tariff of 96.5% error-free seconds and 99.7% availability.
- **P-User:** This filter allows you to set the filter thresholds as percentages of error-free seconds and availability.
- **S-User:** This filter allows you to define the thresholds in terms of seconds per 15-minute interval for ES, UAS, BES, SES, LOFC, ES-L, SEFS, and OOFS. Only the register intervals that exceed the thresholds are displayed.
- **Bar Chart:** This additional option allows you to observe a graphic display of the performance data for the 24-hour period selected. The data displayed depends on the hardware revision level of the CSU circuit element whose data is requested. For AS2000 circuit elements, the data displayed depends on the register set (USER, Additional, etc.) selected. 551VST type hardware revisions 2.0 and earlier show only the ES, UAS, BES, and SES data.

4. If you choose **P-Use** , the *Select Minimum Threshold(s)* screen appears.


Select minimum threshold(s)
Percentage error-free.....(0-100) 0
Percentage available.....(0-100) 0
Thresholds are minimum req'd over time/date range
Enter 0 to disable a specific threshold check
Press F5 to accept thresholds entered
Press F2 to return to previous menu

Enter the desired percentage of error-free seconds and percent availability threshold settings and press **F5** to accept the thresholds. If you only want to inspect one of these thresholds, enter a zero to disable either threshold check.

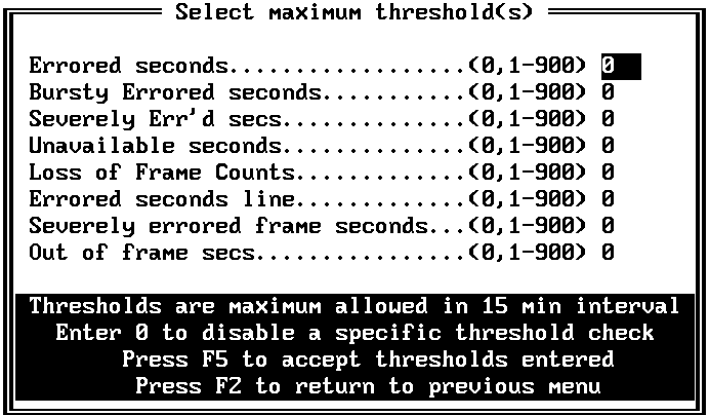
5. If you choose **S-Use** , the *Choose Filter Selection Logic* screen appears.


Choose filter selection logic
Or select if ANY selected thresholds are exceeded
And select if ALL selected thresholds are exceeded
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

Select from one of the two choices on this screen:

- Select a logical *OR* function so that the filter logic is met if any of the thresholds are exceeded per interval.
- Select a logical *AND* function so that all selected thresholds must be met or exceeded before the data meets the filter logic for each interval.

The *Select Maximum Threshold(s)* screen appears.

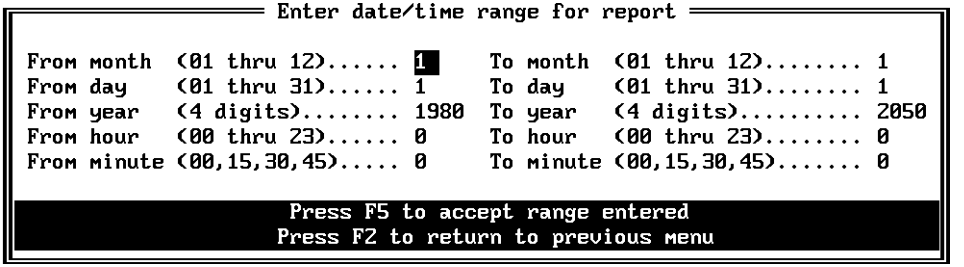

Select maximum threshold(s)
Errored seconds.....(0,1-900) 0
Bursty Errored seconds.....(0,1-900) 0
Severely Err'd secs.....(0,1-900) 0
Unavailable seconds.....(0,1-900) 0
Loss of Frame Counts.....(0,1-900) 0
Errored seconds line.....(0,1-900) 0
Severely errored frame seconds...(0,1-900) 0
Out of frame secs.....(0,1-900) 0
Thresholds are maximum allowed in 15 min interval
Enter 0 to disable a specific threshold check
Press F5 to accept thresholds entered
Press F2 to return to previous menu

You may choose "0" (zero) to disable a threshold check, or you may choose a time interval between 1 and 900 seconds in any 15-minute interval.

Type in the threshold settings, and press **F5** to store them. Only those intervals that have at least one parameter exceeding the thresholds (if you selected an *OR* function) or have all parameters exceeding the threshold (if you selected an *AND* function) appear.

Steps 6 and 7 deal with setting the date and time range for the S-user or P-user filters.

6. After selecting the filter option in Step 3 and completing Step 4 or 5 (if **S-User** or **P-User** was chosen), the *Enter Date/Time Range for Report* screen appears.


Enter date/time range for report
From month (01 thru 12)..... 1
To month (01 thru 12)..... 1
From day (01 thru 31)..... 1
To day (01 thru 31)..... 1
From year (4 digits)..... 1980
To year (4 digits)..... 2050
From hour (00 thru 23)..... 0
To hour (00 thru 23)..... 0
From minute (00,15,30,45)..... 0
To minute (00,15,30,45)..... 0
Press F5 to accept range entered
Press F2 to return to previous menu

Enter the date and time range over which you want performance data analysis to occur. The beginning and end of the period for the analysis is set to the nearest quarter hour.

After entering the date and time range, press F5 to accept the date/time range, or press F2 to return to the previous screen. (This step does not apply if the **Bar Chart** filter is chosen.)

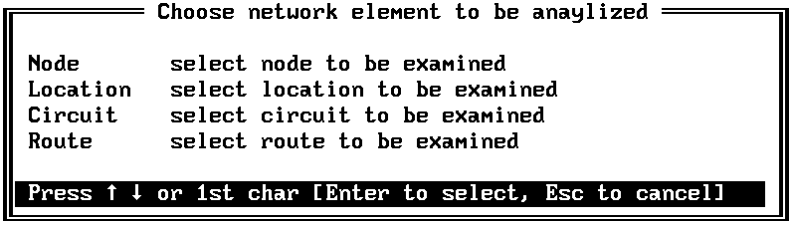
If the **From** and/or **To** dates fall outside the range of available data, Access Manager generates a warning message indicating which date parameters have fallen outside the range. This message also indicates that the date and time range has been reset.

Pressing any key returns you to the *Enter Date/Time Range for Report* screen. From this screen, you can either change the date and time to some period within the available range, or you can press F2 to return to the previous screen.

7. If the **Bar Chart** option was chosen in Step 3, a different *Date and Time* screen appears. Enter the starting date and time only. The ending date and time is always 24 hours after your entered starting time.

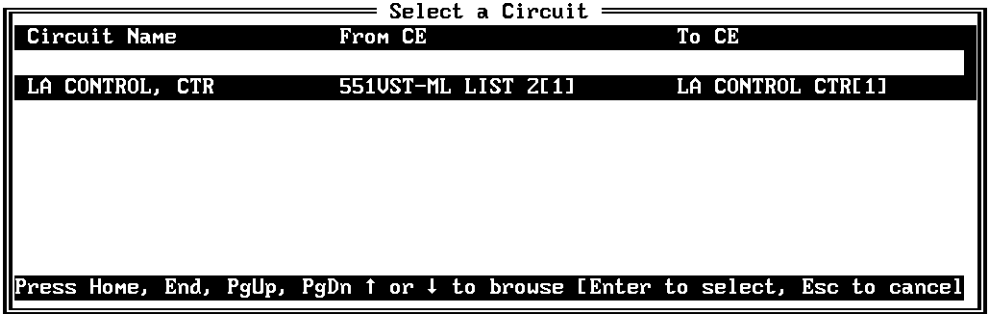
Steps 8 and 9 deal with choosing network elements and circuits.

8. After you specify the date and time range, the *Choose Network Element to be Analyzed* screen appears.


Choose network element to be anaylized
Node select node to be examined
Location select location to be examined
Circuit select circuit to be examined
Route select route to be examined
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

This screen gives you a choice of analysis methods (by node, location, circuit, or route). In the following sub-steps, please wait while Access Manager analyzes the performance data records.

- If you chose **`Circuit`** in Step 8, the *Select A Circuit* screen appears.

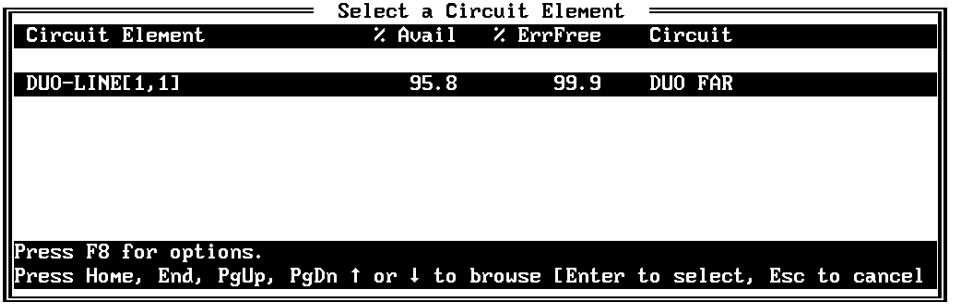

Select a Circuit
Circuit Name
From CE
To CE
LA CONTROL, CTR
551VST-ML LIST 2[1]
LA CONTROL CTR[1]
Press Home, End, PgUp, PgDn ↑ or ↓ to browse [Enter to select, Esc to cancel]

  Place the cursor at the circuit to be analyzed, and press Enter. Both the circuit elements associated with the circuit are listed.

- If you chose **`Node`** in Step 8, the *Select a Node* screen appears. Select the node. All the circuit elements associated with the node are listed.
- If you chose **`Location`** in Step 8, the *Select a Location* screen appears. Select the node at the location you want. All the circuit elements associated with the node are listed.

- If you chose **Route** in Step 8, the *Select A Route* screen appears. Place the cursor at the route to be analyzed, and press Enter. All the circuit elements associated with the route are listed.

9. The *Select A Circuit Element* screen appears after a period of time dependent on the size of the record log.



If, instead of getting this menu, you get a message that there is no detail data, you cannot analyze the performance data. There are three possible reasons for this message:

- The circuit elements associated with the selected node, location, route or circuit have no data that meets the filter's minimum criterion. (That is, a circuit element is only listed for further analysis if it has a percentage of availability and percentage of error-free seconds less than or equal to the minimum of the filter.)
- The circuit elements associated with the selected node, location, route, or circuit are not configured.
- No data was collected by Access Manager for one or more of the following reasons:
  - Access Manager was not operating during the time period selected.
  - Polling was disabled for the time period selected.
  - The **Installed and Operational** option in the selected node and/or circuit elements are set to **NO**.
  - The **Retrieve Performance Data** option for the circuit elements (associated with the selected node, location, route, or circuit) are set to **NO**.

From this screen, select the circuit element to be viewed for detailed data. (See Step 13 for the F8 options.)

Steps 10 through 12 deal with choosing performance data filters. A distinction is made between the bar chart analysis option and other performance data filters

10. One of two screens will appear:

    - If the *Circuit Element Detail* screen appears, continue with Step 11.

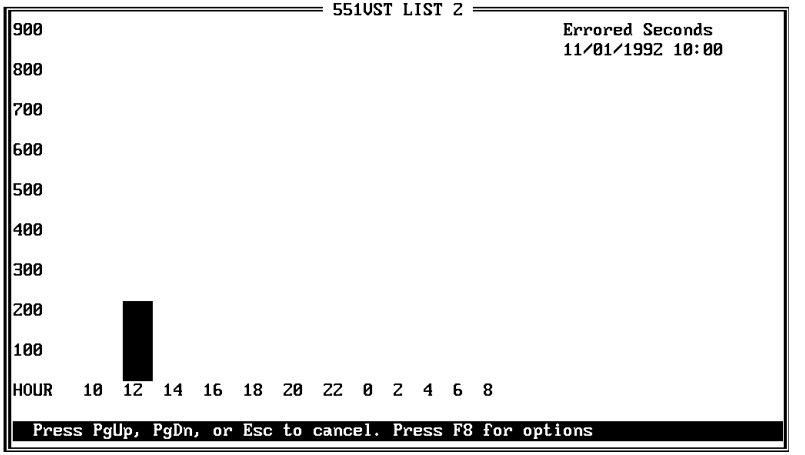
Circuit Element Detail

Date	Time	Circuit Element	ES	UAS	BS	SES	LOFC	ES-L	SEFS	OOFS
01/23	10:00	551VST LIST 2	...	...	...	...	...	...	...	...
01/23	10:15	551VST LIST 2	...	...	...	...	...	...	...	...
01/23	10:30	551VST LIST 2	...	...	...	...	...	...	...	...
01/23	10:45	551VST LIST 2	0	900	0	0	1	0	10	0
01/23	11:00	551VST LIST 2	0	900	0	0	0	0	0	0
01/23	11:15	551VST LIST 2	0	900	0	0	0	0	0	0
01/23	11:30	551VST LIST 2	0	841	0	0	0	3	0	0
01/23	11:45	551VST LIST 2	142	19	24	0	0	152	0	0
01/23	12:00	551VST LIST 2	139	0	0	0	0	139	0	0
01/23	12:15	551VST LIST 2	138	0	0	0	0	139	0	0

Press Home, End, PgUp, PgDn, ↑ or ↓ to browse [Esc to cancel]
Press F8 for options

    - If the bar chart of Figure 7 -1, “Typical 24-Hour Performance Data Bar Chart” appears; then continue with Step 12.

Figure 7-1 Typical 24-Hour Performance Data Bar Chart



KEY: | indicates the end of available data
* indicates that the data overflows the vertical scale

You can select any of the available registers by pressing the PgUp or PgDn keys. The Ctrl ← or Ctrl - key combinations can be used to access the far-end CSU circuit element or to return to the near-end CSU circuit element.

Note: *If you do not see either of the above screens, you will probably get a message stating that there is no detail data. This message will appear during Step 9 if none of the circuit elements associated with the node, location, or circuit have detailed data.*

11. When the *Circuit Element Detail* screen appears (Step 10), use the directional (arrow) keys to view the different intervals.

    All intervals in the performance database (including unavailable intervals within the selected date and time range) are displayed, except the S-User (user-selected seconds) filter.

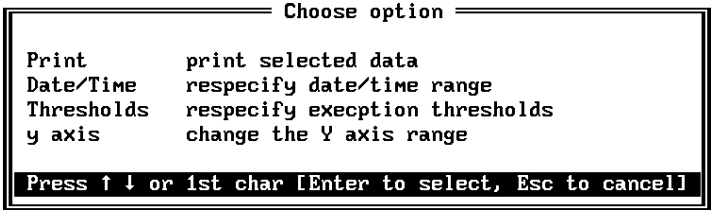
For **S-Use** , only those intervals with at least one parameter exceeding the specified thresholds are shown.

This in a data field	Means
`. . . . (dots)`	No data is available for that time interval.
`N/A`	The circuit element does not support that type of data collection.
`dis`	Collection of performance data in the slot was disabled for the period displayed (AS2000 and ConnecT1 Plus only

12. The bar chart is displayed. If intervals of data are missing in the selected 24-hour interval, they appear as a solid block in the line below the time axis. If the vertical bar (**|**) appears below the time axis, it indicates there is no data after that time. If an asterisk (*****) appears at the top of a bar of data, it indicates the data is greater than the top of the chart.

Steps 13 through 15 deal with editing the performance data filter options.

13. If you wish to change the options by which you analyze the selected circuit element (including changing theY-axis of the bar chart) or if you want to print selected data, press (F8) . The *Choose Option* screen appears, showing numerous options.

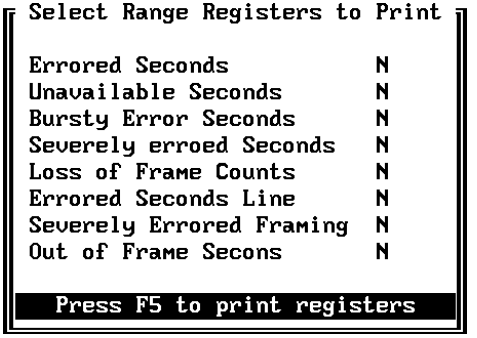

Choose option
Print print selected data
Date/Time respecify date/time range
Thresholds respecify execption thresholds
y axis change the Y axis range
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

This screen is available when (F8) is pressed from Bar Chart Display or from the *Select A Circuit Element* or *Circuit Element Detail* screens. Not all options appear for all analyses.

14. Place the cursor on the desired option, and press (Enter) to select or (Esc) to cancel.

- If you select the **Print Selected Data** option, the data printed depends upon what screen you were in when you pressed F8. If you were in the *Select a Circuit Element* screen, a list of circuit elements is printed. If you were in the *Circuit Element Detail* screen, the detailed data for that circuit is printed.

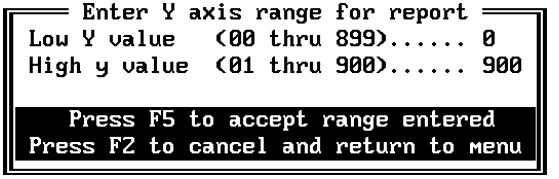
  Furthermore, if you were viewing a bar chart, you must reply to the *Select Registers to Print* screen before you can start printing.


Select Range Registers to Print
Errored Seconds N
Unavailable Seconds N
Bursty Error Seconds N
Severely erroed Seconds N
Loss of Frame Counts N
Errored Seconds Line N
Severely Errored Framing N
Out of Frame Secons N
Press F5 to print registers

- If you select the **Respecify Date/Time Range** option, you are presented with the *Date And Time Range Selection* screen with the range you last selected. After changing the range, press F5 to save your selection and then press F2 to start the data analysis.
- If you select the **Thresholds** option, you are returned to the *Choose Filter for Performance Data* screen. After changing the exception threshold (that is, the filter), you are given confirmation that the threshold has been successfully changed. Depending on the previous threshold selected, you may also be presented with the **Time and Date Range** screen.

  After you have changed the exception threshold and pressed F5, the message THE THRESHOLD HAS BEEN SUCCESSFULLY CHANGED appears. After acknowledging the message, or if no confirmation message is displayed, the data is analyzed and the *Select A Circuit Element* screen reappears.

- If you select the **Change the Y axis** option (which appears only if you are displaying the bar chart), the *Enter Y-Axis Range for Report* screen appears.


Enter Y axis range for report
Low Y value (00 thru 899)..... 0
High y value (01 thru 900)..... 900
Press F5 to accept range entered
Press F2 to cancel and return to menu

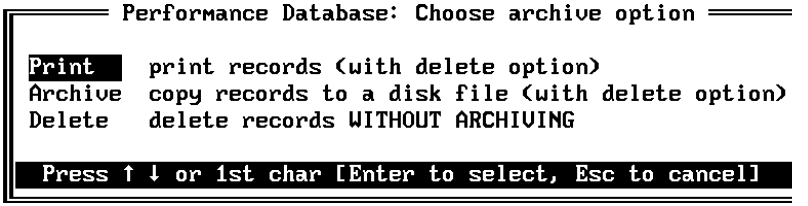
Set the range as desired and press F5 to save the selected range. The available Y-axis range is from 0 to 900 seconds per interval.

15. This completes the procedure for reporting and analyzing the performance data records of a circuit element.

Archiving performance data

To archive performance data:

1. Starting from the *Main Menu*, select **Database Access**. The *Database Access(Performance Database Analysis)* screen appears.
2. From this screen, select **Archive**. The *Choose Register Set to be Archived* screen appears.
3. After selecting the register set, the *Archive (Performance Database: Choose Archive Option)* screen appears.


Performance Database: Choose archive option
Print print records (with delete option)
Archive copy records to a disk file (with delete option)
Delete delete records WITHOUT ARCHIVING
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

This screen gives you three options:

- The first option, **`Print`**, allows printing selected records, with an option of deleting those records from the database after these records were printed.
- The second option, **`Archive`**, allows you to archive the selected records to a diskette, with an option of deleting those records after archiving is complete.
- The third option, **`Delete`**, allows you to delete the selected records without archiving.

Data Log record format

The data log records are archived in a format that is compatible with Lotus 1-2-3 (or similar spreadsheet file formats) and dBase III plus (or similar database file formats).

The maximum file size is 65 kilobytes.

The format uses a comma-delimited, ASCII record format. Three different file formats are used:

- `PDyymmdd.XXX` (USER data)
- `NDyymmdd.XXX` (Additional data)
- `DDyymmdd.XXX` (EQPT data)

Where:

- `yy` = year of archive
- `mm` = month of archive
- `dd` = day of archive
- `XXX` = filename extension, numbered sequentially from 001 to 999

The month, date, and year (yymmdd) used in the archive file name are those that you specify in the *Archive Cutoff Date* screen. The current date (or system date) is not automatically used.

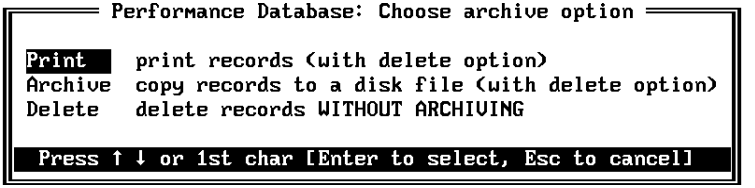
The archive process always creates records starting with extension 001. If previous data log archives have been performed with the same cut-off date on the same disk drive, and in the same directory, then existing archive file(s) are overwritten.

Printing reports and deleting the data

To print records, with the option of deleting those records:

1. Starting from the *Main Menu*, select **Database Access**. The *Database Access(Performance Database Analysis)* screen appears.

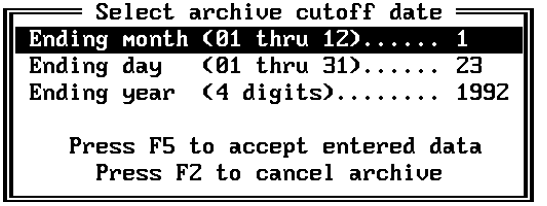
2. From this screen, select **Archive**. The *Archive (Performance Database: Choose Archive Option)* screen appears.


Performance Database: Choose archive option
Print print records (with delete option)
Archive copy records to a disk file (with delete option)
Delete delete records WITHOUT ARCHIVING
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

3. From this screen , select **Print**. The *Choose Register Set to be Archived* screen now appears.

4. Select the register type whose performance data records you want to print. **EQPT** and **Additional** register types are not present nor reported for 551VST type circuit elements.

   A *Select Archive Cutoff Date* screen appears.


Select archive cutoff date
Ending month (01 thru 12)..... 1
Ending day (01 thru 31)..... 23
Ending year (4 digits)..... 1992
Press F5 to accept entered data
Press F2 to cancel archive

5. Enter the month, day, and year (four digits) of the date up to which you wish to print the performance data records. The default date is the current date.

6. Enter a new date, or press F5 to accept the date displayed. Press F2 to cancel the request. Pressing Esc (escape key) any time after the printing has started aborts the print function.

7. After all the selected records are printed, you are presented with the option of deleting all the performance data records up to the date that you had selected.To retain the records in the database, type **N** (or any key other than **Y**).

8. All information in the database prior to and including the selected date is sent to the report printer. The printer can be a file on a disk drive, as defined in the *Report Printer Definition* screen.

9. See Appendix E "Archive File Formats" for an analysis of this performance data log. This completes the printing of performance data records (of the type selected).

Copying reports to disk and deleting the data

To copy the reports to disk and delete the data:

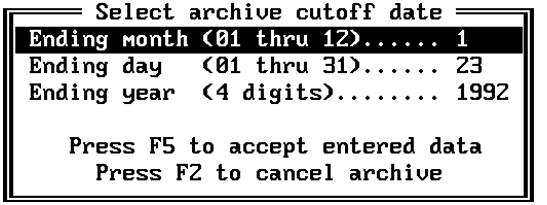
1. Starting from the *Main Menu*, select **`Database Access`**.

2. From the *Database Access(Performance Database Analysis)* screen, select **`Archive`**. The *Archive (Performance Database: Choose Archive Option)* screen appears.

3. From this screen, select **`Archive (Copy Records to Disk with Delete Option)`**.

   The *Choose Register Set to be Archived* screen now appears.

4. Select the register type whose performance data records you want to archive. **`EQPT`** and **`Additional`** register types are not present nor reported for 551VST type circuit elements. A *Select Archive Cutoff Date* screen appears.


Select archive cutoff date
Ending month (01 thru 12)..... 1
Ending day (01 thru 31)..... 23
Ending year (4 digits)..... 1992
Press F5 to accept entered data
Press F2 to cancel archive

5. Enter the month, day, and year (four digits) of the date up to which you wish to archive the performance data records. The default date is the current date.

6. Press (F5) to accept the date displayed or enter a new date. Press (F2) to cancel the request.

7. The *Select Drive* screen now appears. Enter the letter of the disk drive where you want the archived records to be sent and then press F5. Or, press F2 to cancel the archive process.

8. Verify that the files are being copied. If the drive you select is not ready or no diskette has been inserted, an error message appears. If a disk not ready error message is received, type **Y** after the drive is ready and a diskette has been inserted, or press any other key to halt the operation.

   If the drive selected is the drive on which Access Manager is running, the archived files are placed in the Access Manager database directory. If any other drive is selected, the files are placed in the last previously selected directory of that drive.

9. If you wish to abort the archive function while the records are being copied, press Esc key.

10. After all the selected records are copied, you are presented with the option of deleting all the performance data records up to the date that you have selected. Type **N** (or any key other than **Y**) to not delete the records and retain them in the database.

11. This completes the copying of performance data records (of the type selected).

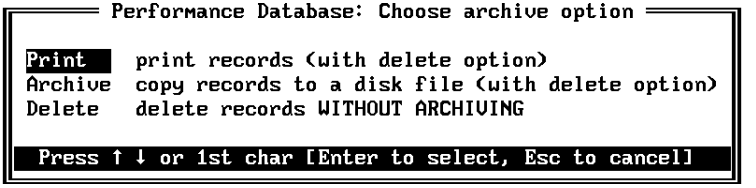
Note: *The archive process always creates files starting with extension* `001`. *If you have performed previous alarm log archives on the same drive, under the same directory, with the same cutoff day, the existing archive file(s) are overwritten. Refer to Appendix E "Archive File Formats" for the record format.*

Deleting records without archiving the data

To delete the records without archiving the data:

1. Starting from the *Main Menu*, select **Database Access**.

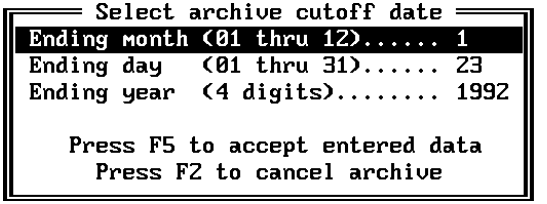
2. From the *Database Access(Performance Database Analysis)* screen, select **Archive**. The *Archive (Performance Database: Choose Archive Option)* screen appears.


Performance Database: Choose archive option
Print print records (with delete option)
Archive copy records to a disk file (with delete option)
Delete delete records WITHOUT ARCHIVING
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

3. From this screen, select **Delet** . The *Choose Register Set to be Archived* screen now appears.

4. Select the register type whose performance data records you want to delete. **EQPT** and **Additional** register types are not present nor reported for 551VST type circuit elements.

   A *Select Archive Cutoff Date* screen appears.


Select archive cutoff date
Ending month (01 thru 12)..... 1
Ending day (01 thru 31)..... 23
Ending year (4 digits)..... 1992
Press F5 to accept entered data
Press F2 to cancel archive

5. Enter the month, day, and year (four digits) of the date up to which you wish to delete the performance data records. The default date is the current date.

6. Press F5 to accept the date displayed, or enter a new date. Press F2 to cancel the request.

7. A warning message appears to confirm the deletion process. The **Delete** option erases performance data records from the database (that is, log) without saving them. Type **Y** to continue with deletion, or press any other key to cancel deletion.

8. This completes the deletion of performance data records (of the type selected).

Chapter

8

Monitoring and Troubleshooting Access Manager

This chapter tells you how to use Access Manager 2000 to perform operations on circuit elements on a DS1 (T1) network. The categories of operations you can perform are:

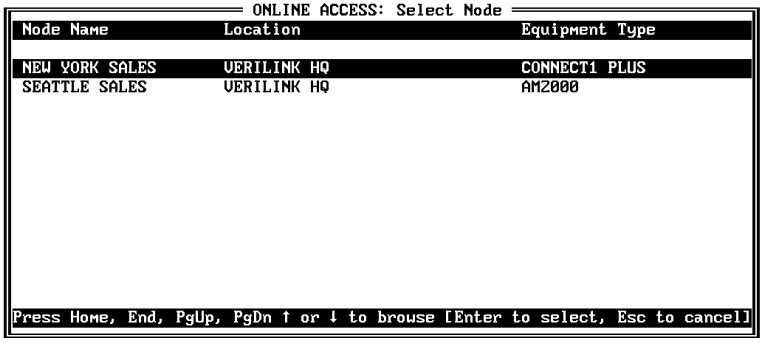
- Viewing circuit element status individually and in a node
- Verifying on-line circuit element configuration
- Retrieving performance data
- Resetting user performance registers
- Activating and deactivating CSU and DIU loopbacks
- Applying test signals to CSUs and DIUs

These operations are performed within the **`On-line Access`** option of the *Main Menu.* To access a node on-line, a query path must first be defined in its node configuration.

Selecting a node

To perform these operations, you need to access a circuit element by first defining its parent node. Follow these general steps to access a node:

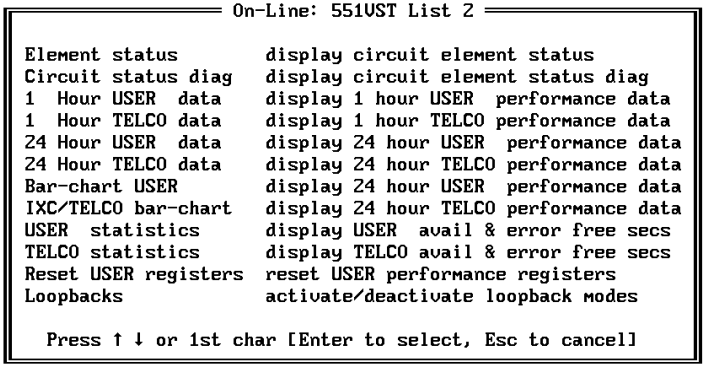
1. Select **`On-line Access`** from the *Main Menu*. The *Online Access: Select Node* screen appears.



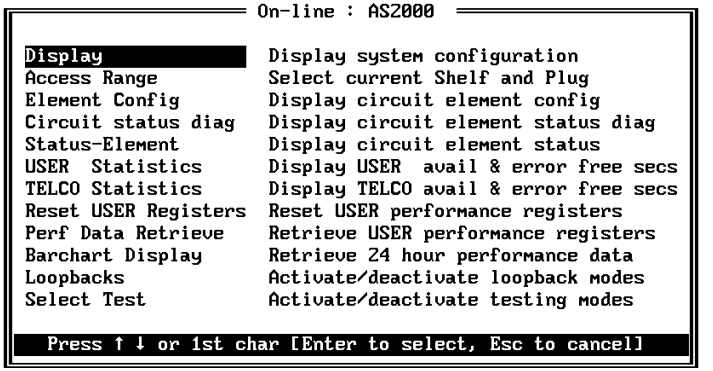
2. Select the node you want from the *On-line Access: Select Node* screen, and press (Enter).

   This step defines the parent node. The sub-menu you see depends on the type of node you selected. The nodes and their corresponding On-line Access sub-menus are as follows:

   - If you selected a 551VST type node, you will see this screen.


On-Line: 551VST List 2
Element status
display circuit element status
Circuit status diag
display circuit element status diag
1 Hour USER data
display 1 hour USER performance data
1 Hour TELCO data
display 1 hour TELCO performance data
24 Hour USER data
display 24 hour USER performance data
24 Hour TELCO data
display 24 hour TELCO performance data
Bar-chart USER
display 24 hour USER performance data
IXC/TELCO bar-chart
display 24 hour TELCO performance data
USER statistics
display USER avail & error free secs
TELCO statistics
display TELCO avail & error free secs
Reset USER registers
reset USER performance registers
Loopbacks
activate/deactivate loopback modes
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

- If you selected an AS2000 type node, you will see this screen.



The sub-menu you see displays a list of access options. These options let you access the node and perform a variety of operations. The options listed in the *On-line Menu* depend on which type of single-line or multiline node is accessed.

The single-line CSU node types do not have the **`Display`** or **`Access Range`** options in their *On-line Access menus*. Furthermore, a 551VST List 1/A doesn't have the element status display capability. When the far-end status is displayed via the Ctrl → key combination, the near-end CSU status reappears.

3. Select the option you want and press Enter. You will see another screen that corresponds to the option you selected.

Since the functional specifications of the variousVerilink access systems differ, Access Manager presents a different set of menus for the two basic types of nodes.

These two types of nodes are:

- **AS2000 type node** (includes Access System 2000 and ConnecT1./ Plus hardware; ConnecT1 Plus is a low-cost Dual-Line Shelf implementation of the AS2000 system). AS2000 and ConnecT1 Plus menus are used almost interchangeably in this chapter. This chapter will also reflect these similarities by showing the ConnecT1 Plus model name and number in parentheses: For example, NCC

2020 (CCC 1020). There are some nomenclature differences in the model names and numbers between the CSUs and DIUs of the two products:

CSU/DSU type	CSU Model Name	DSU Model Name
AS2000:	NCC 2020	DIU 2130
	TAC 2010	DIU 2140
ConnecT1 Plus:	CCC 1020	DIU 1130
	TAC 1010	No ConnecT1 Plus equivalent to DIU 214

The DIU 2140 is unique to AS2000 hardware. Otherwise, each element in the AS2000 line has a functional counterpart in the ConnecT1 Plus line. The ConnecT1 Plus functional counterpart to the AS2000 CSU NCC 2020 is the CCC 1020, and so forth.

- **551VST type node** (includes 551VST type Single-Line nodes; SIM, NC/E, 551VST ML List 1, and 551VST ML List 2 multiline nodes). There are some functional differences among these systems. Specific menus may be shown to point out these differences.

Selecting multiline circuit elements

You must access a circuit element before you can perform an operation on it. Only the NC/E and Access System 2000 multiline systems have shelf number and plug-in unit range selection options.A single-line CSU circuit element does not have an **`Access Range`** option in its *On-line* Menu.

Follow these steps to access a circuit element:

1. Select **`On-line Access`** from the *Main Menu*.

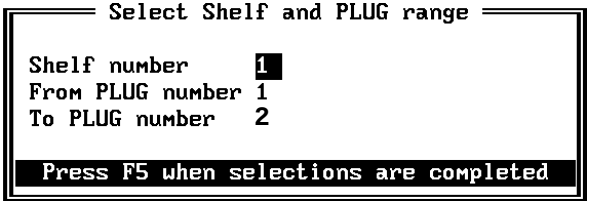
   When you get the *On-line Access: Select Node* screen, select the node you want and press Enter.

   You will be presented with the *On-line Access sub-menu* that corresponds to type of node you selected. These sub-menus are described at the beginning of this chapter

2. If you are presented with the *On-line: 551VST Type* screen, move the cursor to **`Access CSU`** and press Enter.

If you are presented with the *On-line: AS2000 Type* screen, move the cursor to **Access Range** and press Enter.

3. You will be presented with the sub-menu shown below.



4. Select the circuit elements you want by entering the shelf number and the range of the associated plug-in slot numbers for those elements. The shelf and plug-in slot number ranges for the different node types are as follows:

Type of node	Shelf range	Plug (element) range
NC/E	1, 2. 3. 4. or 5	1 to 10
SIM		1 to 10
551VST ML List 1		1 to 28
551VST ML List 2		1 to 28
Access System	1 to 4 (?)	1 to 13 (multiline shelf) 1 to 2 (dual-line shelf)
ConnecT1 Plus	1 to 2	1 to 2

If the range of elements is set to less than the maximum the shelf allows, only the specified elements can be accessed.

5. Press F5 to accept the selected range.

6. The *On-line: xxx* screen reappears. We'll refer to this as the *On-Line Access sub-menu*. Proceed with the on-line operation you wish to perform.

Displaying circuit element status in a node

The **Display** option shows a multiline node's configuration and the operational status of its circuit elements. If a status change to a circuit element occurs while in the display, Access Manager retrieves the current status of the circuit element and updates the display

The **Display** option is ***not*** available single-line CSUs. The single-line CSUs are:

- 551VST List 1/A
- 551VST List 1/B
- 551VST List 2

To view circuit element status in a node:

1. In the *On-line Access sub-menu*, move the cursor to **Displa** , and press **Enter**.
2. You are presented with a configuration screen that corresponds to the node you selected on the *On-line Access: Select Node* screen. The node types and their corresponding configuration sub-menus areas follows:
   - If you selected a 551VST type node, you'll a screen similar to this.

```
                    NC/E Configuration
      C F  C F  C F  C F  C F  C F  C F  C F  C F  C F  C F  S   Any
Shelf 0 A  0 A  0 A  0 A  0 A  0 A  0 A  0 A  0 A  0 A  0 A  I   Fuses
----- 1 R  2 R  3 R  4 R  5 R  6 R  7 R  8 R  9 R  0 R  0 R  M   Blown?
  1   - -  0 0  - -  - -  0 0  - -  - -  X -  - -  - -  0   No
  2   - -  - -  0 -  0 0  0 0  0 0  - -  - -  - -  S -  0   No
  3   - -  - -  - -  0 0  - -  - -  - -  0 0  0 0  X -  0   Yes
  4   ? -  ? -  ? -  - -  - -  - -  - -  - -  - -  - -  X   No
  5   - -  - -  - -  - -  - -  - -  - -  - -  ? -  ? -  -   No

Firmware V2.9    Hardware V0.0

     0=operative  -=absent  X=missing  S=spare  ?=undetermined
```

   - If you selected an AS2000 type node, you'll see this screen.

```
                  AS2000 Configuration: SMDS
Firmware V4.2       Hardware V0.8
       C  S F  S F  S F  S F  S F  S F  S F  S F  S F  S F  S F  S F  S F
 Shelf T  0 A  0 A  0 A  0 A  0 A  0 A  0 A  0 A  0 A  1 A  1 A  1 A  1 A
 _____ L  1 R  2 R  3 R  4 R  5 R  6 R  7 R  8 R  9 R  0 R  1 R  2 R  3 R
 1 - M 1 SO -  -    -    -    -  MX   -    -    -    -    -    -    -

1st Letter:S=NCC2020 C=TAC2010 D=DIU2130 O=DIU2140 T=TIU2850 ?=undetermined
             M=DIU2132
2nd Letter:O=Operational Alarm enabled  N=Operational Alarm disabled
             -=Absent  X=Missing  S=Spare
      Press F8 to retrieve & store node and element configuration
```

3. When you are finished reviewing the display, press F2 to return to the *On-line Access: Select Node* screen. You may now select another node.

The configuration **Display** sub-menus present you with the following information:

Shelf type

Underneath the word *Shelf* is a number followed by a dash then a letter: example: 1 - S. This indicates that the first shelf in the node is a Multiline Shelf (MLS). There are only three types of shelves:

- Multiline (MLS 2200, 13 slots; 551V ST MLB/MLE, 14 slots)
- Dual-line (2 slots)
- Single (self-contained unit)

Configuration symbols

Configuration symbols, or codes, are used to display the status of the different elements in each shelf. They appear as the second letter in each slot's configuration line.

Code	Condition and Meaning
0	**Operative:** The equipment is installed, configured, and has not failed at the near end. For a far-end circuit element, it indicates that a T1 signal is being received.
-	**Absent:** The module is physically absent from the shelf and is not configured. If the incoming T1 signal is lost from a near-end CSU, the far end displays the element as absent.
X	**Missing:** The CSU or SIM is configured in the Access Manager database, but the module itself: • is missing • has failed • has a blown 5V fuse.

Code	Condition and Meaning
S	**Spare:** The CSU is present in a shelf but not configured in the Access Manager database as **`Installed and Operational`**. The far-end CSU, if equipped, is shown as an operative CSU.
?	**Undetermined:** The status of the element cannot be determined. Either: The node controller (SIM) in the shelf has • failed • blown a fuse • been powered down, or • been removed so that the status of the elements in that particular shelf cannot be determined. ***or*** An individual multiline CSU has a blown fuse, and the CSU is **`Installed and Operational`** in the database.

. . . for a non-AS2000 node

Access Manager 2000 handles non-AS2000 nodes, including NC/E multiline nodes and 551 series nodes.

A typical **`NC/E Configuration`** display shows up to five 551VST MLS shelves controlled by an NC/E.

NC/E Configuration

Shelf	C F 0 A 1 R	C F 0 A 2 R	C F 0 A 3 R	C F 0 A 4 R	C F 0 A 5 R	C F 0 A 6 R	C F 0 A 7 R	C F 0 A 8 R	C F 0 A 9 R	C F 0 A 0 R	S I M	Any Fuses Blown?
1	- -	0 0	- -	- -	0 0	- -	- -	X -	- -	- -	0	No
2	- -	- -	0 -	0 0	0 0	0 0	- -	- -	- -	S -	0	No
3	- -	- -	- -	0 0	- -	- -	- -	0 0	0 0	X -	0	Yes
4	? -	? -	? -	- -	- -	- -	- -	- -	- -	- -	X	No
5	- -	- -	- -	- -	- -	- -	- -	- -	? -	? -	-	No

Firmware V2.9 Hardware V0.0

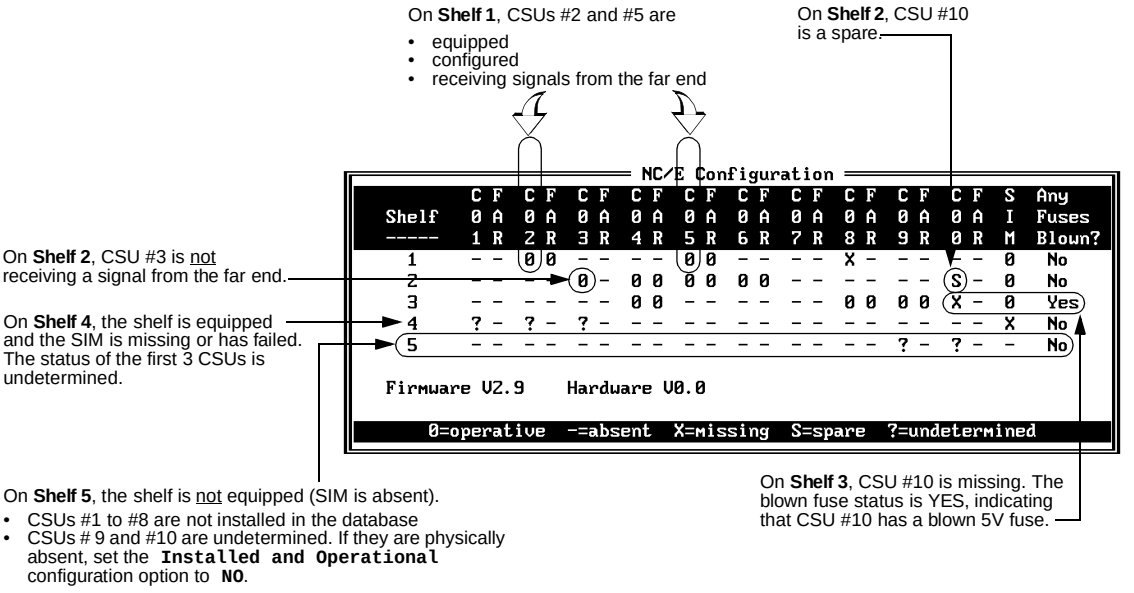
0=operative -=absent X=missing S=spare ?=undetermined

Each shelf has one SIM shelf controller and up to ten 4016-R CSU circuit elements.

The CSUs are designated by C01 to C10, reading from left to right. Paired with each of these CSUs is a far-end CSU, designated by a column labeled “FAR”.

For a 551VST ML List 1 or List 2 node, the status of the 28 possible near-end CSUs are on one line with the corresponding far-end CSU status on the next line. The fuse status is not shown, and the power supply status appears on the right side.

Specifically, the display example shows the following:

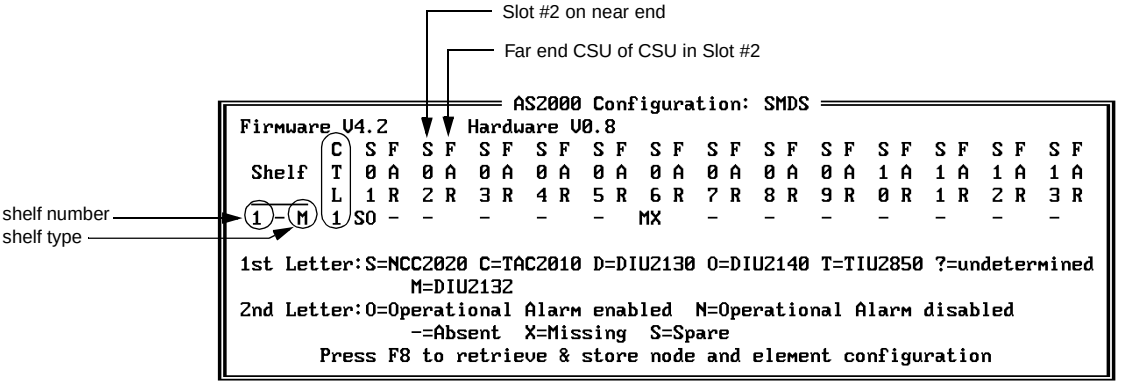

On **Shelf 1**, CSUs #2 and #5 are
• equipped
• configured
• receiving signals from the far end
On **Shelf 2**, CSU #10 is a spare.
NC/E Configuration
Shelf
Any Fuses Blown?
1 – – 0 0 – – – – 0 0 – – – – X – – – – – 0 No
2 – – – – 0 – 0 0 0 0 0 0 – – – – – – S – 0 No
3 – – – – – – 0 0 – – – – – – 0 0 0 0 X – 0 Yes
4 ? – ? – ? – – – – – – – – – – – – – – X No
5 – – – – – – – – – – – – – – – – ? – ? – – No
Firmware V2.9 Hardware V0.0
0=operative –=absent X=missing S=spare ?=undetermined
On **Shelf 2**, CSU #3 is not receiving a signal from the far end.
On **Shelf 4**, the shelf is equipped and the SIM is missing or has failed. The status of the first 3 CSUs is undetermined.
On **Shelf 5**, the shelf is not equipped (SIM is absent).
• CSUs #1 to #8 are not installed in the database
• CSUs # 9 and #10 are undetermined. If they are physically absent, set the **Installed and Operational** configuration option to **NO**.
On **Shelf 3**, CSU #10 is missing. The blown fuse status is YES, indicating that CSU #10 has a blown 5V fuse.

For the 551VST ML List 1 and 2, the following differences exist in the *NC/E Configuration Display* and *SIM Configuration Display* screens:

- The possible CSUs are numbered 1 to 28.
- The *Far-End CSU* indicator is on the line below the near-end.
- The right side of the screen has a Power Supply A and B (551VST List 1/A or List 1/B), or A, B, C, and D (for 551VST List 2) status indication.

. . . for an AS2000 node

A typical Access System 2000 node configuration is shown below.


Slot #2 on near end
Far end CSU of CSU in Slot #2
AS2000 Configuration: SMDS
Firmware V4.2
Hardware V0.8
Shelf
C T L
S F 0 A 1 R
S F 0 A 2 R
S F 0 A 3 R
S F 0 A 4 R
S F 0 A 5 R
S F 0 A 6 R
S F 0 A 7 R
S F 0 A 8 R
S F 0 A 9 R
S F 1 A 0 R
S F 1 A 1 R
S F 1 A 2 R
S F 1 A 3 R
1 - M 1 SO - - - - - MX - - - - - - -
shelf number
shelf type
1st Letter: S=NCC2020 C=TAC2010 D=DIU2130 O=DIU2140 T=TIU2850 ?=undetermined
M=DIU2132
2nd Letter: O=Operational Alarm enabled N=Operational Alarm disabled
-=Absent X=Missing S=Spare
Press F8 to retrieve & store node and element configuration

To have the maximum number of slots, each node can have up to 2 multiline and 4 dual-line shelves, numbered 1, 2, 3, and 4. The multiline shelves have 13 slots for circuit elements, and the dual-line shelves have 2 slots for circuit elements.

In this screen, the slots are numbered S01 to S13, reading from left to right. Paired with each of these slots is FAR, which designates the far-end CSU if the near-end slot holds a CSU circuit element. But FAR should be disregarded if the near-end slot holds a DIU or a TIU

Finally, the first column to the right of the shelf number indicates the slot of the node's master controller (an NCC 2020 or CCC 1020). The node's master controller must ***always*** be in Shelf 1, Slot 1.

The near-end Access System 2000 circuit element status is displayed with two letters shown in the S01 through S13 columns. The first letter identifies the type of circuit element:

Code	Element	Element Function
S	NCC 2020	Node Controller and Channel Service Unit (CSU)
C	TAC 2010	T1 Aggregate and Channel Service Unit (CSU)

D	DIU 2130	High-Speed Data Interface Unit
T	TIU 2850	Timing Interface Unit
M	DIU 2132	SMDS Data Interface Unit
O	DIU 2140	Low Speed Data Interface Unit

Codes are used to display the status of the different elements in each shelf. They appear as the second letter in each slot's configuration line.

Code	Condition and Meaning
O	**Operational - Alarm Enabled:** The equipment is installed, configured, and has not failed at the near end. For a CSU or DIU, it also indicates that alarm reporting is enabled. For a far-end circuit element, it indicates that a T1 signal is being received. • If the **O** is *green*, it indicates the element is not in alarm. • If the **O** is *red*, it indicates the element is in alarm.
N	**Operational - Alarm Disabled:** Element is operational with a disabled alarm reporting capability. • If the **N** is *green*, it indicates the element is not in alarm. • If the **N** is *red*, it indicates the element is in alarm.
-	**Absent:** The module is physically absent from the shelf and is not configured. If the incoming T1 signal is lost from a near-end CSU, the far end displays the element as absent.
X	**Missing:** The element is configured in the Access Manager database, but the module itself: • is missing • has failed, or • has a blown 5V fuse.
S	**Spare:** The element is present in a shelf but not configured in the Access Manager database as **`Installed and Operational`**.

Code	Condition and Meaning
?	**Undetermined:** The status of the element cannot be determined. Either: The node controller (NCC 2020) in the shelf has • failed • blown a fuse • been powered down, or • been removed so that the status of the elements in that particular shelf cannot be determined. ***or*** The node controller does not recognize an element type identifier code.

The indicators that are red on a color monitor are shown as intensified white on a monochrome monitor.

The FAR column of the Access System 2000 configuration display shows the status of the associated far-end circuit element.

Example:

The screen below shows a node consisting of one multiline shelf with two elements.

```
                    AS2000 Configuration: SMDS
Firmware V4.2          Hardware V0.8
        C  S F  S F  S F  S F  S F  S F  S F  S F  S F  S F  S F  S F  S F
 Shelf  T  0 A  0 A  0 A  0 A  0 A  0 A  0 A  0 A  0 A  0 A  1 A  1 A  1 A
        L  1 R  2 R  3 R  4 R  5 R  6 R  7 R  8 R  9 R  0 R  1 R  2 R  3 R
 1 - M  1 SO -  -    -    -    -    MX   -    -    -    -    -    -    -

1st Letter:S=NCC2020 C=TAC2010 D=DIU2130 O=DIU2140 T=TIU2850 ?=undetermined
           M=DIU2132
2nd Letter:O=Operational Alarm enabled  N=Operational Alarm disabled
           -=Absent  X=Missing  S=Spare
      Press F8 to retrieve & store node and element configuration
```

- [Shelf1, Slot1] has an *operational* NCC 2020. The element is installed, configured, and has not failed. Alarm reporting is enabled.

- [Shelf1, Slot 6] has a *missing* DIU 2132. The element's configuration is stored in the database, but the module itself is missing, has failed, or has blown a 5V fuse.

If you press F8 while viewing a **Node Configuration** screen, the current configuration of the node and accessed circuit element is retrieved and stored in the AM2000 database.

For the 551VST ML List 1 and 2, the following differences exist in the **NC/E Configuration** and **SIM Configuration Display** Menus:

- The possible CSUs are numbered 1 to 28.
- The *Far-End CSU* indicator is on the line below the near-end.
- The right side of the screen has a Power Supply A and B (for 551VST List 1/A or List 1/B), or A, B, C and D (for 551VST List 2) status indication.

Displaying individual circuit element status

Element status gives you the current configuration, status, and revision level of the first CSU in the selected range.

Non-AS2000 node

The 551VST List 1/A does not have an **Element Status** option.

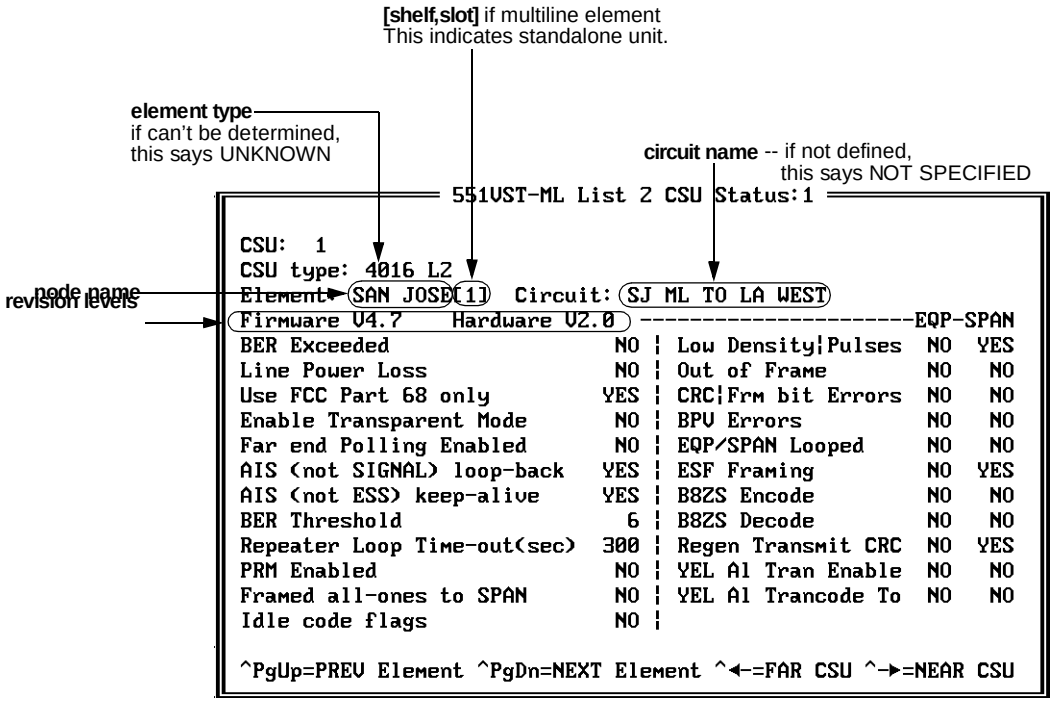
For all other ESF CSUs except the 4016 List 1, the *Element Status* screen is nearly identical to that for the NC/E and SIM equipped with a 4016-R.

Only 551VST List 1/B and List 2 CSUs have the **Enable Alarm Latch** option.

To determine the current status for a 551VST type circuit element:

1. In the *On-line Access sub-menu*, move the cursor to **Element Status**, and press Enter.

2. A CSU status screen appears.


[shelf,slot] if multiline element
This indicates standalone unit.
element type
if can't be determined,
this says UNKNOWN
circuit name -- if not defined,
this says NOT SPECIFIED
node name
revision levels
551VST-ML List 2 CSU Status:1
CSU: 1
CSU type: 4016 L2
Element: SAN JOSE(1) Circuit: SJ ML TO LA WEST
Firmware V4.7 Hardware V2.0 ----------EQP-SPAN
BER Exceeded NO | Low Density|Pulses NO YES
Line Power Loss NO | Out of Frame NO NO
Use FCC Part 68 only YES | CRC|Frm bit Errors NO NO
Enable Transparent Mode NO | BPV Errors NO NO
Far end Polling Enabled NO | EQP/SPAN Looped NO NO
AIS (not SIGNAL) loop-back YES | ESF Framing NO YES
AIS (not ESS) keep-alive YES | B8ZS Encode NO NO
BER Threshold 6 | B8ZS Decode NO NO
Repeater Loop Time-out(sec) 300 | Regen Transmit CRC NO YES
PRM Enabled NO | YEL Al Tran Enable NO NO
Framed all-ones to SPAN NO | YEL Al Trancode To NO NO
Idle code flags NO |
^PgUp=PREV Element ^PgDn=NEXT Element ^←=FAR CSU ^→=NEAR CSU

This screen shows a typical status screen for a 551VST ML List 2 CSU. If the CSU is a multiline element, its slot and shelf appear in the first line.

3. View all the circuit elements in the range.

   The Ctrl PgUp and Ctrl PgDn key combinations, respectively, let you access the previous or next circuit element in the range you have selected.

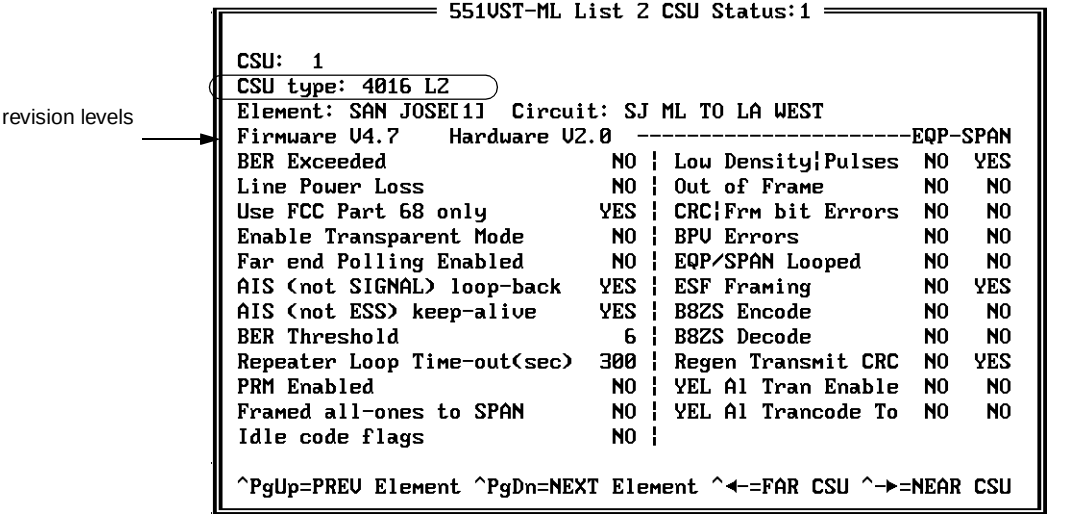
   To display the status of a circuit element (such as a CSU) at the far-end via the ESF Data Link, press Ctrl ← after accessing the near-end circuit element.

   All circuit element revisions, except for the 551VST List 1/B CSU, respond to this command. A 551VST List 1/A does not have the status display capability. When the far-end status is displayed, press Ctrl → to see the near-end CSU status again.

4. Press F2 to return to the *On-line Access Menu*.

Reviewing the status

This figure shows status and configuration information for a 4016 List 2 CSU in a shelf.


551VST-ML List 2 CSU Status:1
CSU: 1
CSU type: 4016 L2
Element: SAN JOSE[1] Circuit: SJ ML TO LA WEST
Firmware V4.7 Hardware V2.0 ----------EQP-SPAN
BER Exceeded NO | Low Density|Pulses NO YES
Line Power Loss NO | Out of Frame NO NO
Use FCC Part 68 only YES | CRC|Frm bit Errors NO NO
Enable Transparent Mode NO | BPV Errors NO NO
Far end Polling Enabled NO | EQP/SPAN Looped NO NO
AIS (not SIGNAL) loop-back YES | ESF Framing NO YES
AIS (not ESS) keep-alive YES | B8ZS Encode NO NO
BER Threshold 6 | B8ZS Decode NO NO
Repeater Loop Time-out(sec) 300 | Regen Transmit CRC NO YES
PRM Enabled NO | YEL Al Tran Enable NO NO
Framed all-ones to SPAN NO | YEL Al Trancode To NO NO
Idle code flags NO |
^PgUp=PREV Element ^PgDn=NEXT Element ^←=FAR CSU ^→=NEAR CSU
revision levels

Both equipment side and network status of the CSU is displayed. Notice that one column of status conditions applies only to the DTE side, while beside it is a column of status conditions applying only to the NET side. The parameters listed in this display depend on the type of CSU.

The Circuit Element Status screen is identical (except for the Enable Alarm Latch, Framed All-Ones, and Idle Code Flags options, which are only on the 551VST List 1/B and List 2) only for the following node types:

- NC/E
- SIM
- 551VST List 1/B
- 551VST List 2
- 551VST ML List 1 (with 4016 List 2)

The fields and their values are described below

Field	Value	Meaning
BER Exceeded	No	The user-set BER threshold for the network has not been exceeded.
Line Power Loss	No	The critical circuits are receiving power (line or local).
Enable Transparent Mode	No	The CSU is not operating in transparent mode.
Far-end Polling Enabled	No	The near-end CSU is not set to poll the far-end CSU status.
AIS (Not Signal) Loopback	Yes	AIS is sent to the non-looped direction during a PLB, LLB, or ELB..
AIS (Not ESS) Keep-Alive	Yes	AIS is used as a network keep-alive signal.
BER threshold	6	The BER threshold is 10^{-6}. Other options include **INVALID**, **DISABLED**, **4**, **5**, **6**, **7**, **8**, and **9**. **INVALID** indicates that an incorrect combination of hardware switches has been set.
Repeater Loopback Time-out	300	The permissible range for the RLB time-out is from 1 to 43,200 seconds.
PRM (Performance Report Messages) Enabled	No	PRMs are not being sent. If this status is **YES**, the PRMs are transmitted according to ANSI T1.403-1989.
Framed All-ONEs to SPAN (NET)	No	A framed All-ONEs test signal is not being sent to the network. The first **YES** indicates that an excess of ZEROs or a low average density is being received from the EQPT. The second **YES** indicates that the CSU is receiving pulses from the NET.
Idle Code Flags	No	The ESF Data Link has an All-ONEs idle code (not an ANSI flags idle code).
Low Density Pulse	No	
Out of Frame	Yes, No	The signal from the EQPT is out of frame, while the NET signal is not out of frame.

Field	Value	Meaning
CRC/Frm Bit Errors	Yes, No	The framing bit error are being received from the EQPT, while no CRC errors are being received from theNET. For ESF framing, **YES** indicates that CRC errors are being received. For SF (D4) framing, **YES** indicates that frame bit errors are being received.
BPV Errors	No	BPV error are not being received fro either the EQPT side or NET side.
DTE (EQPT)/SPAN (NET) Looped	No	Neither an RLB nor an ELB is in progress (EQPT side), and either an LLB or PLB is in progress (NET side).
ESF Framing toward the NET	Yes	But since ESF toward the EQPT is NO, the framing toward the EQPT isSF.
B8ZS Encode	No	Neither the network (NET) nor the equipment (EQPT)is set for B8ZS line coding (transmit direction).
B8ZS Decode	No	Neither the NET nor the EQPT is set for B8ZS decoding (receive direction).
Regen Transmit CRC		
YEL AL Tran Enable	No	
YEL AL Transcode To	No	Yellow alarms are not currently being transcoded from the network to the equipment, or from the equipment to the network.

Note: *The single-line 551VST List 1/A and List 2 also have an Enable Alarm Latch configuration, showing whether the local BER alarm deactivates on clearing (NO) or stays on until manually cleared (YES).*

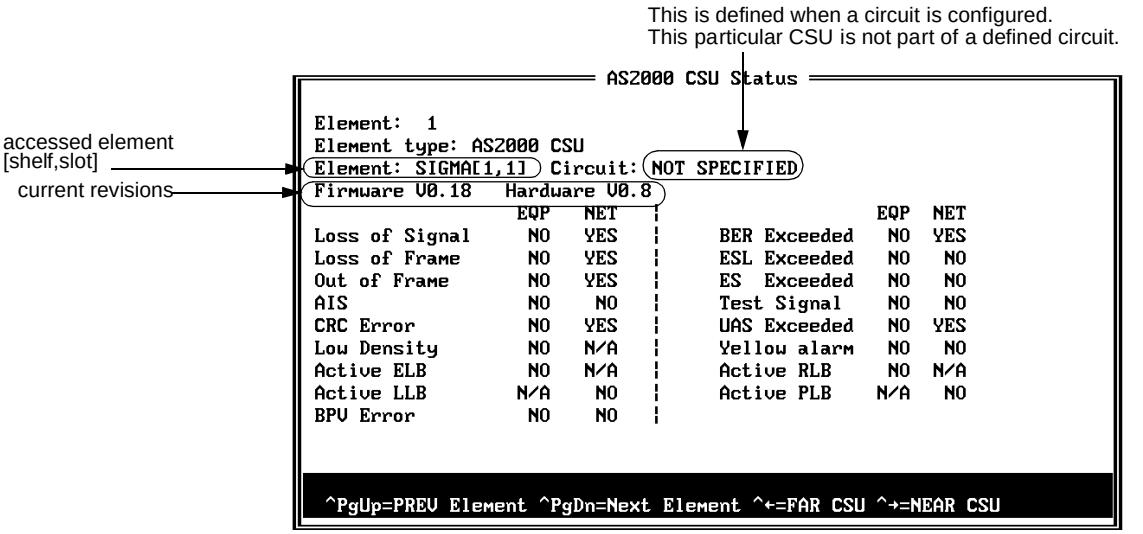
AS2000 node

To view the current status for a AS2000 or ConnecT1 Plus circuit element:

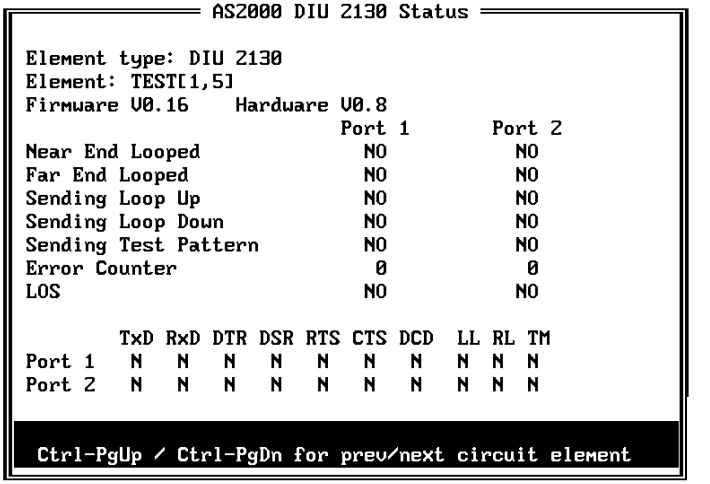
Move the cursor to **Status-Element**, and press (Enter). A *Circuit Status* screen for the first circuit element appears. Each type of circuit element has specific screen.

The circuit elements and their corresponding screens are as follows:

- If the circuit element is an NCC 2020, CCC1020, TAC 2010, or TAC 1010, a status screen similar to the one below appears.


This is defined when a circuit is configured.
This particular CSU is not part of a defined circuit.
accessed element [shelf,slot]
current revisions
AS2000 CSU Status
Element: 1
Element type: AS2000 CSU
Element: SIGMA[1,1] Circuit: NOT SPECIFIED
Firmware V0.18 Hardware V0.8
EQP NET
Loss of Signal NO YES
Loss of Frame NO YES
Out of Frame NO YES
AIS NO NO
CRC Error NO YES
Low Density NO N/A
Active ELB NO N/A
Active LLB N/A NO
BPV Error NO NO
BER Exceeded NO YES
ESL Exceeded NO NO
ES Exceeded NO NO
Test Signal NO NO
UAS Exceeded NO YES
Yellow alarm NO NO
Active RLB NO N/A
Active PLB N/A NO
^PgUp=PREV Element ^PgDn=Next Element ^←=FAR CSU ^→=NEAR CSU

- If the circuit element is a DIU 2130 or DIU 1130, a status screen similar to the one below appears.


AS2000 DIU 2130 Status
Element type: DIU 2130
Element: TEST[1,5]
Firmware V0.16 Hardware V0.8
Port 1 Port 2
Near End Looped NO NO
Far End Looped NO NO
Sending Loop Up NO NO
Sending Loop Down NO NO
Sending Test Pattern NO NO
Error Counter 0 0
LOS NO NO
TxD RxD DTR DSR RTS CTS DCD LL RL TM
Port 1 N N N N N N N N N N
Port 2 N N N N N N N N N N
Ctrl-PgUp / Ctrl-PgDn for prev/next circuit element

- If the circuit element is a DIU 2140, a status screen similar to the one below is displayed.

```
                    AS2000 DIU 2140 Status

Element:  2
Element type: DIU 2140
Element: BOSTON SALES[1,2]
Firmware V0.6    Hardware V0.1

                         Port 1    Port 2    Port 3    Port 4    Port 5
Near End Looped            NO        NO        NO        NO        NO


 Ctrl-PgUp / Ctrl-PgDn for prev/next circuit element
```

- If the circuit element is a TIU 2850 or TIU 1850, a status screen similar to the one below appears.

```
                    AS2000 TIU 2850 Status

Element:  2
Element type: TIU 2850
Element: SAN JOSE[1,2]
Firmware V0.4    Hardware V0.8

      Frequency            0
      EQP Clock           NO
      NET Clock           NO
      DIU                 NO
      EXT TTL             NO
      EXT 422             NO
      Two clocks?         NO


 Ctrl-PgUp / Ctrl-PgDn for prev/next circuit element
```

5. View all the circuit elements in the range.

   The Ctrl PgUp and Ctrl PgDn key combinations, respectively, let you access the previous or next circuit element in the range you have selected.

   To display the status of a circuit element (such as a CSU) at the far-end via the ESF Data Link, press Ctrl ← after accessing the near-end circuit element.

6. After viewing the current status, press F2 to return to the *On-line Access Menu*.

Reviewing CSU status

Except for *Low Densit* , the CSU monitors the status conditions for both the NET and EQPT (i.e, data equipment) sides. Loopbacks apply to one side only. The status items are as follows:

Field	Value	Meaning
Loss of Signal		SeeAT&T Reference 62411.
Loss of Frame		SeeAT&T Reference 54016.
Out of Frame		Although this condition, as defined in AT&T Reference 54016, might not last long enough to be visible to the operator, the CSU keeps the **YES** indication alive for up to 1 second after the condition clears, to make it visible.
AIS (Alarm Indication Signal)		See ANSI T1.403.
CRC Error		See *Out of Frame* above. The CRC-6 error indication is also kept alive for 1 second.
Low Density		The circuit element is stuffing ONEs into the signal it has been configured to do when receiving a low density signal. This only applies to the EQPT side.
Active ELB, LLB, RLB, PLB	No	None of these loopbacks are in progress. These loopbacks are activated and deactivated by commands sent over the ESF Data Link.
BPV Error		See *Out of Frame* above. The BPV error indication is also kept alive for 1 second.

Field	Value	Meaning
ES-L, ES, UAS, BER Sec Exceeded	No	The number of user-defined ES-L, ES, UAS, and/or BER alarm threshold seconds with excessive error counts have not been exceeded and therefoer have not caused an alarm. These thresholds are displayed for the incoming signals from both the EQPT and network (NET). For more information on these alarm threshold setting options, seeAT&T Reference 54016.
Test Signal		Circuit element is sending a test signal.
Yellow Alarm		See ANSI T1.403

Reviewing DIU statu

This section covers status and revision levels for the DIU 2130, DIU 2140, and DIU 1130. All associated screens show the circuit element number [shelf, slot] and type, DIU name, associated DS1 circuit name, and current DIU hardware and firmware revisions. Additional status information also appears for each EQPT data channel (i.e., data port) of the current DIU.

Field	Value	Meaning
Near-End Looped	No	A loopback is not in progress on an EQPT channel (that is, data port) of the near-end DIU.
Far-End Looped	No	A loopback is not in progress on an EQPT channel (that is, data port) of the far-end DIU.
Sending Loop Up	No	A loop-up code is not being sent to the far-end DIU to activate a channel (that is, data port) loopback there.
Sending Loop Down	No	A loop-up code is not being sent to the far-end DIU to deactivate a channel (that is, data port) loopback there.
Sending Test Pattern	No	The DIU is not currently applying a test signal to an EQPT channel (that is, data port).
Runnign BER Test	No	A bit error rate test is not currently in progress on the DIU.

Field	Value	Meaning
BER Error Counter	0	No bit errors were recorded by the DIU during a bit error rate (BER) test.
BER	XX	The bit error rate, XX (calculated by the DIU after a BER test), was completed on an EQPT channel (that is, data port).
Handshake signals	**Y** = high signal, **N** = low signal	
TxD	Y or N	Transmit Data
RxD	Y or N	Receive Data
DTR	Y or N	Data Terminal Ready
DSR	Y or N	Data Set Ready
RTS	Y or N	Ready To Send
CTS	Y or N	Clear to Send
DCD	Y or N	Data Carrier Detect - when this has a value of **Y**, the line is up and running.
V.54 Leads	**Y** = present, **N** = absent	
LL	Y or N	Refers to the data channel loopbacks on the DI U2130 at the local node (the node to which the DTE sending LL is connected).
RL	Y or N	Refers to the data channel loopbacks on the DI U2130 on the far end of the network connection.
TM	Y or N	This is set high **Y**) by the DIU 2130 upon successfully activating LL or RL to notify the DTE of its current state.

Reviewing TIU statu

This section covers revision levels for the TIU 2850 and TIU 1850.

In the following screen, the status indicators show the source of timing for the TIU .

```
AS2000 TIU 2850 Status

Element:  2
Element type: TIU 2850
Element: SAN JOSE[1,2]
Firmware V0.4    Hardware V0.8

      Frequency          0
      EQP Clock         NO
      NET Clock         NO
      DIU               NO
      EXT TTL           NO
      EXT 422           NO
      Two clocks?       NO


 Ctrl-PgUp / Ctrl-PgDn for prev/next circuit element
```

- If both the **EXT TTL** and **EXT 422** lines on the screen are **NO** and the **Frequency** line indicates Nx56kbps or Nx64kbps, then the TIU is timing off the data bus from a DIU.
- If either the **EXT TTL** or **EXT 422** line is **YES** on the screen and **Frequency** line is Nx56kbps or Nx64kbps, then the TIU is timing off a data port.

The following items explain the fields in this screen.

Field	Value	Meaning
Frequency		The frequency of the clock source from which the TIU derives synchronization.
EQPT Clock	Yes	The source clock is in the signal received fro the EQPT.
NET Clock	Yes	The source clock is in the signal received fro the NET.
DIU	Yes	The source clock is derived internally, from the DIU
EXT-TTL	Yes	The source clock is from an external source, not EQPT or NET signal, at TTL levels.
EXT-442	Yes	The source clock is from an external source, not EQPT or NET signal, at RS422 levels.

Field	Value	Meaning
TWO CLOCK (2 or more clocks)	Yes	More than one clock source is present. This is a trouble indication because neither clock is used and the TIU is timed internally.
Regen Transmit CRC	Yes	This shows that CRC regeneration occurs toward the network, but not toward the EQPT.
	No	This shows that CRC regeneration occurs toward the EQPT, but not toward the network.
YEL AL Tran Enable	No	Yellow alarm transcoding is currently not enabled toward either the network or the equipment.

If the frequency line on the screen is **0** and all other indicators are **NO**, the TIU is timed internally.

Note: *If an external timing frequency has been applied and the above condition still exists, check the external device providing the timing frequency and all connecting cables.*

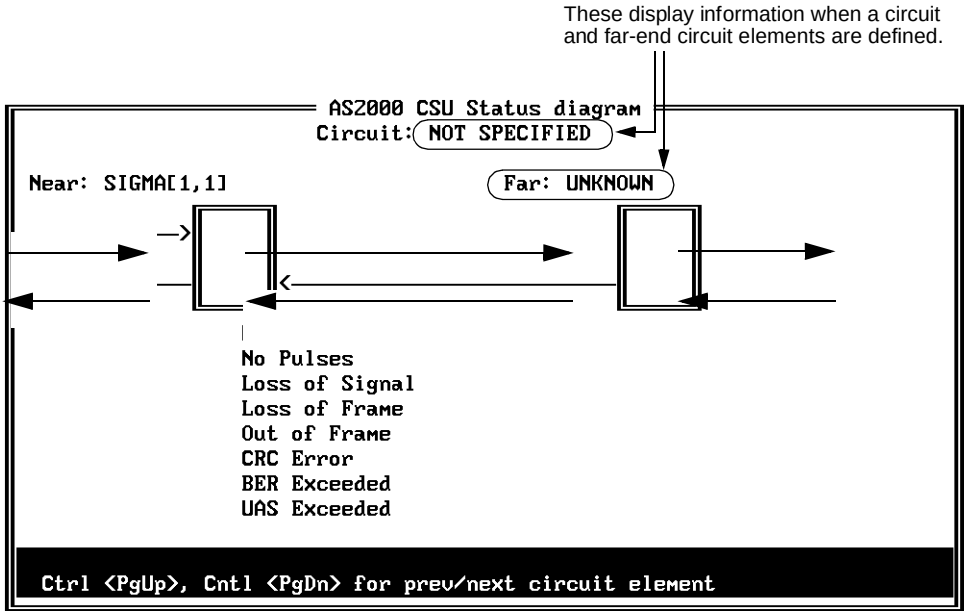
Displaying circuit status

If you want a larger overview of what errors are occurring in the circuit, you can review a status diagram of the circuit.

To review the circuit status:

1. In the *On-line Access* sub-menu, move the cursor to **Circuit Status Diag**, and press Enter.

A status diagram like the one below will appear.



All possible error indications are shown in the screen above.

2. After viewing the current status diagram, press F2 to return to the *On-line Access* Menu.

Alarms are shown at the location at which they occur. If alarms are present, the DS1 line section in alarm appears in flashing red. If no alarms are present, the line section is green (or blank if you are using a monochrome display). Alarm designations are shown flashing adjacent to the circuit section in which they occur.

Any change in status reported by the near-end CSU causes the screen to be updated.

Displaying on-line circuit element configuration

For any AS2000 circuit element, you can review the configuration data present in the element, as opposed to the database. The screens you'll view look exactly like the configuration screens. The difference is that the fields are "read-only". Also, the color of the displayed information is red for the *On-line Access* menu and blue for the *Configuration* menu.

To view on-line circuit element configuration:

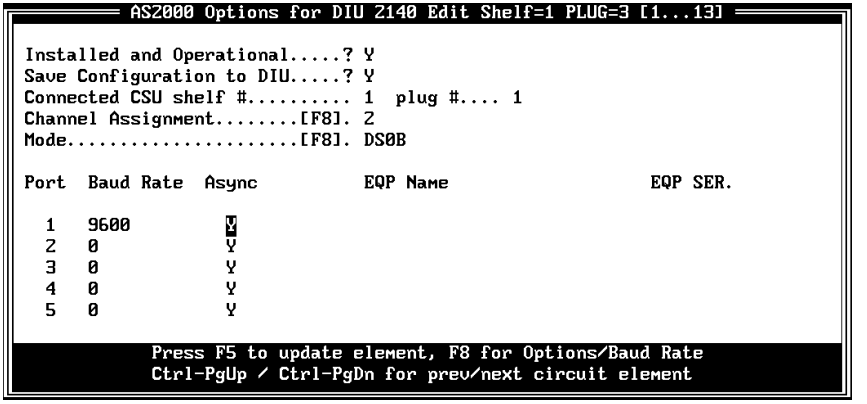
1. In the *On-line Access* screen, move the cursor to **`Element Config`**, and press Enter.

   A circuit configuration screen appears for the first circuit element. Each type of circuit element has a specific screen. The circuit elements and their corresponding screens are as follows:

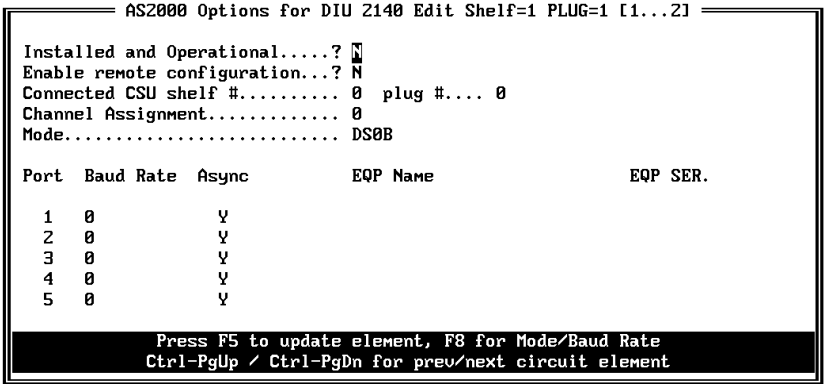
   - If the circuit element is an NCC 2020, CCC 1020, TAC 2010, or TAC 1010, a configuration screen like the one below appears.

```
AS2000 Options for CSU Edit Shelf=1 PLUG=1 [1...13]

*Installed and Operational....? Y       NET LBO (0/7.5/15DB)   [F8]. 0
  Retrieve near perf data[F8]? Y        NET Density enforcement[F8]. 12%+80Z
  Retrieve far  end  data[F8]? N        NET keep-alive         [F8]. AIS
 *Save Configuration to CSU...? Y       NET framing format     [F8]. ESF
  Enable Alarm Reporting [F8]? Y        Enable NET side B8ZS.......? N
  Poll far end status    [F8]. NOPOLL   Regenerate CRC-6 to NET....? Y
  RLB loopback timeout..... 1 MIN      Enable YEL transcode to NET? Y
  Enable PRM.............[F8]. NO      Signal to EQP on NET errors? Y
  AIS(not SIG) during loopback Y        Signal to EQP on NET LOF...? Y
  EQP Distance (feet)    [F8]. 0-133    Signal to EQP on NET LOS...? Y
  EQP framing format     [F8]. SF       NET RCV Jitter BUF=40 bits.? Y
  Enable EQP side B8ZS.......? N        Data Link idlecode=Flags...? N
  Regenerate CRC-6 to EQP....? Y        Power up near end self test? Y
  Enable YEL transcode to EQP? N        Loopback Enable        [F8]? Y
  Signal to NET on EQP errors? Y        Enable testing options [F8]? Y
  Signal to NET on EQP LOF...? Y        DIU data bus used      [F8]. NONE
  EQP RCV Jitter BUF=40 bits.? Y        DIU timing             [F8]. NONE
  Enable EQP OOF transparency? N
   * Disabling this option also disables the indented options below it.
  Press F5 to update element, F6 to update entire range, F8 for options
          Ctrl-PgUp / Ctrl-PgDn for prev/next circuit element
```

- If the circuit element is a DIU 2130 or DIU 1130, a configuration screen similar to the one below appears.


ASZ000 Options for DIU 2140 Edit Shelf=1 PLUG=3 [1...13]
Installed and Operational.....? Y
Save Configuration to DIU.....? Y
Connected CSU shelf #..... 1 plug #.... 1
Channel Assignment.....[F8]. 2
Mode.....[F8]. DS0B
Port Baud Rate Async EQP Name EQP SER.
1 9600 Y
2 0 Y
3 0 Y
4 0 Y
5 0 Y
Press F5 to update element, F8 for Options/Baud Rate
Ctrl-PgUp / Ctrl-PgDn for prev/next circuit element

- If the circuit element is a DIU 2140, a configuration screen showing the current on-line DIU configuration is displayed.


ASZ000 Options for DIU 2140 Edit Shelf=1 PLUG=1 [1...2]
Installed and Operational.....? N
Enable remote configuration...? N
Connected CSU shelf #..... 0 plug #.... 0
Channel Assignment..... 0
Mode..... DS0B
Port Baud Rate Async EQP Name EQP SER.
1 0 Y
2 0 Y
3 0 Y
4 0 Y
5 0 Y
Press F5 to update element, F8 for Mode/Baud Rate
Ctrl-PgUp / Ctrl-PgDn for prev/next circuit element

2. View all the circuit elements in the range.

   The Ctrl PgUp and Ctrl PgDn key combinations, respectively, let you access the previous or next circuit element in the range you have selected.

   To display the status of a circuit element (such as a CSU) at the far-end through the ESF Data Link, press Ctrl ← after accessing the near-end circuit element.

3. After viewing the configuration screen, press F2 to return to the *On-line Access Menu*.

Displaying Telco and User data

For any Verilink CSU, you can review Telco and user data from performance registers. These on-line registers are located in the CSU element.

For allVerilink CSUs, this information is available in breakdowns of 1 hour and 24 hours.

You can also view this information in three different forms. These include ***performance data registers***, ***statistics***, and ***barcharts***.

- ***Performance data registers*** provide you with raw data, displayed by type of error and time interval.
- ***Statistics*** take that raw data and present it to you in terms of percentages.
- ***Barcharts*** provide a visual representation of the performance data.

Up to four types of register sets are available forVerilink equipment: one for equipment parameters and three for network parameters.

Verilink CSUs have register sets for User performance data and Telco data. Older equipment has fewer registers than newer equipment. AS2000 CSUs also provide register sets for equipment data and additional (Verilink-defined) user data for more comprehensive network monitoring. These register sets are summarized in Table 8-1, “Types of performance registers”.

Only the Telco register set cannot be reset by the user.

If a given register is not supported by the equipment, then the data register column will sho **N/A** for “not available” when you use the *On-line Menu* to access the data summaries.

Table 8-1 Types of performance registers

Four register sets are shown here. The first 2 sets, with a white background, are partially or completely available to all Verilink CSUs. The last 2 sets, shown with shading, are only additionally available to AS2000 equipment.

User Performance Data - network user-resettable parameters		
ES	Errored Seconds	
UAS	Unavailable Seconds	
BES	Burst Errored Seconds	
SES	Severely Errored Seconds	
LOFC	Loss-Of-Frame Counts	
ES-L	Errored Seconds - Line	
SEFS	Severely Errored Frame Seconds	
OOFS	Out-Of-Frame Seconds	For non-AS2000 type equipment onl , info included in this data set.
Telco Data - network telco parameters (not user-resettable)		
ES	Errored Seconds	
UAS	Unavailable Seconds	
BES	Burst Errored Seconds	
SES	Severely Errored Seconds	
LOFC	Loss-Of-Frame Counts	
EQPT Data - equipment user-resettable parameters		
ES	Errored Seconds	
UAS	Unavailable Seconds	
ES-L	Errored Seconds - Line	
OOFS	Out-Of-Frame Seconds	
DTED	EQPT Low Density Seconds	
DBER	EQPT Bit Error Rate Alarm Second	
Additional (Verilink-defined) Data - network user-resettable parameters		
OOFS	Out-Of-Frame Seconds	
LOFS	Loss-Of-Frame Seconds	
LOSS	Loss-Of-Signal Seconds	
RAIS	Remote (Yellow) Alarm Indication Second	
AISS	Alarm Indication Signal Seconds	
BERS	Bit Error Rate Second	

Accessing performance registers

To access 551-type performance registers:

1. From the On-line Access submenu,

```
On-Line: 551VST List 2

Element status         display circuit element status
Circuit status diag    display circuit element status diag
1  Hour USER  data     display 1 hour USER  performance data
1  Hour TELCO data     display 1 hour TELCO performance data
24 Hour USER  data     display 24 hour USER  performance data
24 Hour TELCO data     display 24 hour TELCO performance data
Bar-chart USER         display 24 hour USER  performance data
IXC/TELCO bar-chart    display 24 hour TELCO performance data
USER  statistics       display USER  avail & error free secs
TELCO statistics       display TELCO avail & error free secs
Reset USER registers   reset USER performance registers
Loopbacks              activate/deactivate loopback modes

  Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]
```

   select one of the following options:

   - **1 Hour USER data**
   - **1 Hour TELCO data**
   - **24 Hour USER data**
   - **24 Hour TELCO data**

   The appropriate screen will appear

To access AS2000 performance registers:

1. In the *On-line Access sub-menu*, select the **Perf Data Retrieve** option, and press Enter.

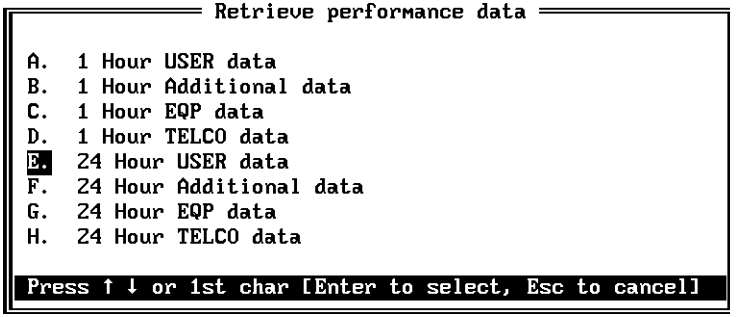
   The following screen will appear:

```
Select element to retrieve data from

A.  CSU
B.  DIU 2132

Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]
```

2. Select the **CSU** option.

Note: *SMDS CSU capability, provided by the DIU 2132, is discussed in a separate manual.*

You are presented with the *Retrieve performance data* screen.


Retrieve performance data
A. 1 Hour USER data
B. 1 Hour Additional data
C. 1 Hour EQP data
D. 1 Hour TELCO data
E. 24 Hour USER data
F. 24 Hour Additional data
G. 24 Hour EQP data
H. 24 Hour TELCO data
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

3. Select one of the EQP or network options listed, and press Enter. The screen which appears will display either 1-hour o r 24hour data for the first circuit element defined in the access range.

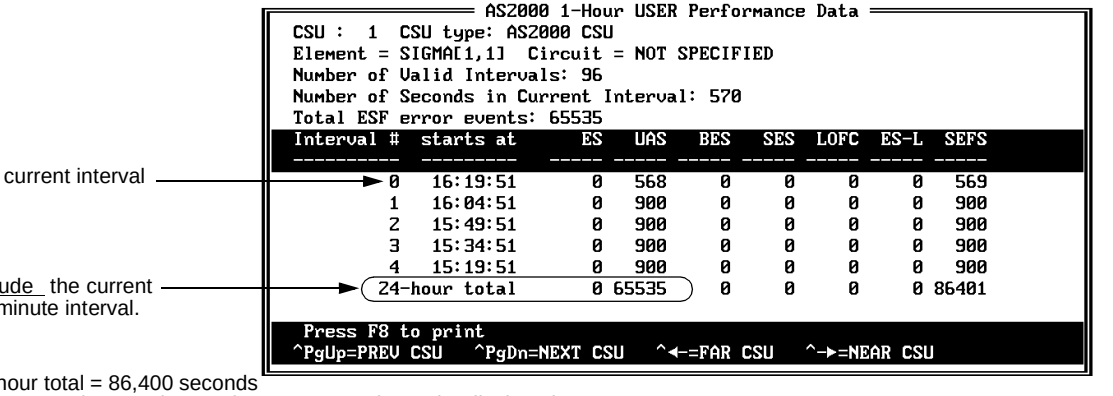
The presentation format is identical for all registers. The columns displayed are appropriate to the type of register set selected.

If data for some registers are not available (typically because the circuit element accessed through the node does not support those registers), the registers appear as **N/A** in their respective columns. However, if all the registers for an interval are unavailable due to resetting or disabling of the registers, that interval is not shown.

If multiple intervals contain all-zero data, they are shown as **To** and **From** intervals, with the time shown as the start time of the latest interval (lowest numbered interval).

1-hour data screens

A 1-hour register screen looks like this:


AS2000 1-Hour USER Performance Data
CSU : 1 CSU type: AS2000 CSU
Element = SIGMA[1,1] Circuit = NOT SPECIFIED
Number of Valid Intervals: 96
Number of Seconds in Current Interval: 570
Total ESF error events: 65535
Interval # starts at ES UAS BES SES LOFC ES-L SEFS
0 16:19:51 0 568 0 0 0 0 569
1 16:04:51 0 900 0 0 0 0 900
2 15:49:51 0 900 0 0 0 0 900
3 15:34:51 0 900 0 0 0 0 900
4 15:19:51 0 900 0 0 0 0 900
24-hour total 0 65535 0 0 0 0 86401
Press F8 to print
^PgUp=PREV CSU ^PgDn=NEXT CSU ^←=FAR CSU ^→=NEAR CSU

current interval

Include the current 15-minute interval.

24-hour total = 86,400 seconds
However, only a maximum of 65,535 seconds can be displayed.

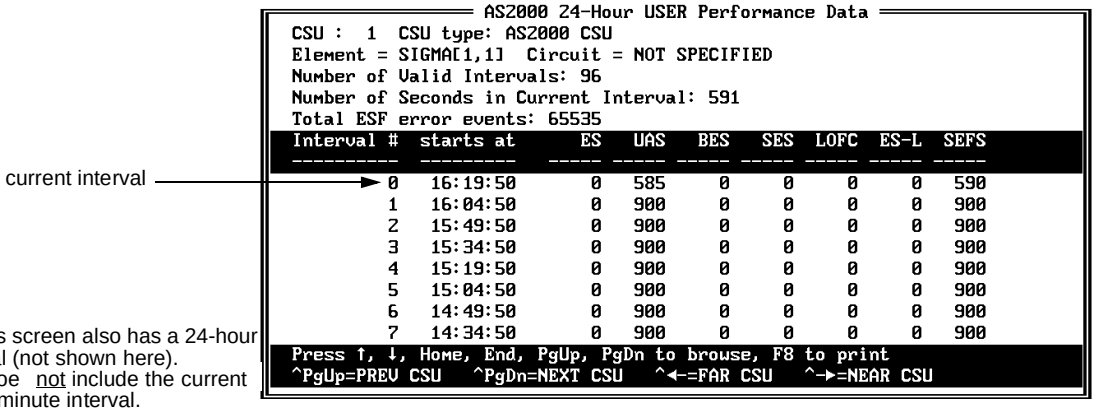
You can view the last four 15-minute intervals. The 24-hour summary is always shown in the last row.

To print the performance data, press **F8**.

To return to the *On-line Access Menu*, press **F2**.

24-hour data screens

A 24-hour register screen looks like this:


AS2000 24-Hour USER Performance Data
CSU : 1 CSU type: AS2000 CSU
Element = SIGMA[1,1] Circuit = NOT SPECIFIED
Number of Valid Intervals: 96
Number of Seconds in Current Interval: 591
Total ESF error events: 65535
Interval # starts at ES UAS BES SES LOFC ES-L SEFS
0 16:19:50 0 585 0 0 0 0 590
1 16:04:50 0 900 0 0 0 0 900
2 15:49:50 0 900 0 0 0 0 900
3 15:34:50 0 900 0 0 0 0 900
4 15:19:50 0 900 0 0 0 0 900
5 15:04:50 0 900 0 0 0 0 900
6 14:49:50 0 900 0 0 0 0 900
7 14:34:50 0 900 0 0 0 0 900
Press ↑, ↓, Home, End, PgUp, PgDn to browse, F8 to print
^PgUp=PREV CSU ^PgDn=NEXT CSU ^←=FAR CSU ^→=NEAR CSU

current interval

This screen also has a 24-hour total (not shown here).
It doe not include the current 15-minute interval.

24-hour total = 65,535 seconds

You can view the last 96 15-minute intervals. The 24-hour summary is always shown in the last row.

Getting around in the screens

Use the following keystrokes to "travel" between screens.

To do this:	Use these keystrokes:
Scroll up, one row at a time	↑
Scroll down, one row at a time	↓
Go to the beginning	Home
Go to the en	End
Go to the next page of data in this screen	PgUp
Go to the previous page of data in this screen	PgDn
Access the previous CSU in the selected range	Ctrl PgUp
Access the next CSU in the selected range	Ctrl PgDn
Display the registers of a CSU at the far-end of the ESF Facility Data Link	First, access the corresponding near-end CSU, then press Ctrl ←

Displaying 24-Hour Performance Data Bar Charts

The bar charts displayed and printed through this option graphically display the performance data registers for the past 24 hours of each register type.

To access bar charts:

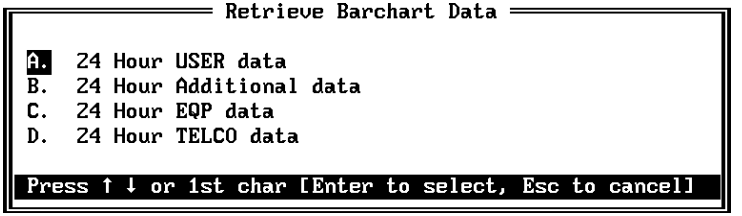
1. When you get the *On-line Access sub-menu*, select a bar chart as follows:

   If you are examining a 551VST type CSU, select **`Bar chart User`** or **`IXC/TELCO Bar Chart`**.

   - User performance data includes the ES, UAS, BES, SES, LOFC, ES-L, and SEFS registers.
   - IXC/Telco performance data includes the ES, BES, UAS, SES, and LOFC registers.

If you are examining an AS2000 CSU, select **Bar Chart Displa** .

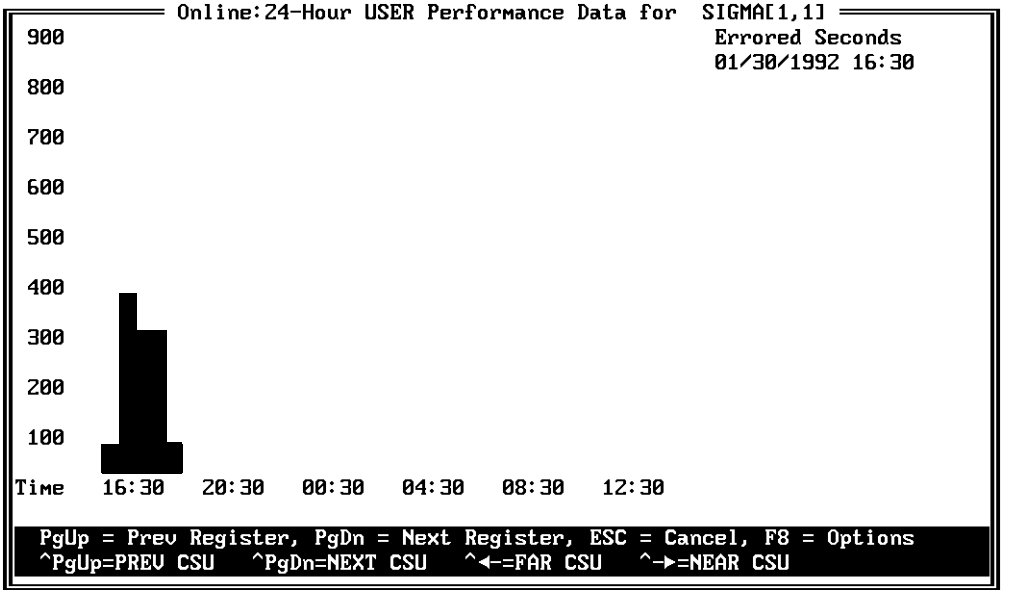
The *Retrieve Bar chart Data* screen appears, listing the groups of performance data registers which may be selected for bar chart display.


Retrieve Barchart Data
A. 24 Hour USER data
B. 24 Hour Additional data
C. 24 Hour EQP data
D. 24 Hour TELCO data
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

2. Select one of the groups listed, and press Enter.

- **A. 24-Hour USER data**: This bar chart shows the performance of the CSU registers, including the ES, UAS, BES, SES, LOFC, ES-L, and SEFS registers.
- **B. 24-Hour Additional data:** This Bar chart shows the performance of the CSU registers, including the OOFS, LOFC, LOSS, RAIS, AISS, and BERS registers.
- **C. 24-Hour EQPT data:** This bar chart shows the performance of the CSU registers, including the ES, UAS, ES-L, OOFS, DTED, and DBER registers. It is important to note that these are the only EQPT side registers, and all other registers are NET side.
- **D. 24-Hour Telco data:** This bar chart shows the performance of the nodes registers, including the ES, UAS, BES, SES, and LOFC registers.

3. The *24-Hour xxx Performance Data Bar Chart* of the first CSU circuit element is now displayed

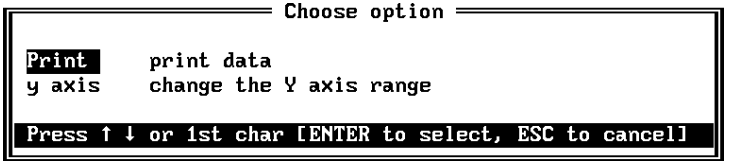


View performance data bar charts from the other registers.

To access the previous or next CSU circuit element in the range you have selected, use the Ctrl PgUp and Ctrl PgDn key combinations, respectively.

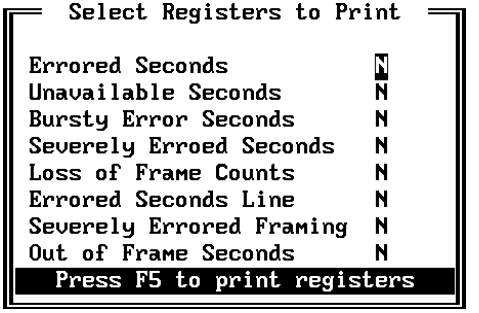
To display the registers of a CSU at the far end via the ESF Data Link, press Ctrl ← after accessing the near-end CSU circuit element.

4. If you wish to print the bar chart, or change the Y axis, press F8 The following screen appears.



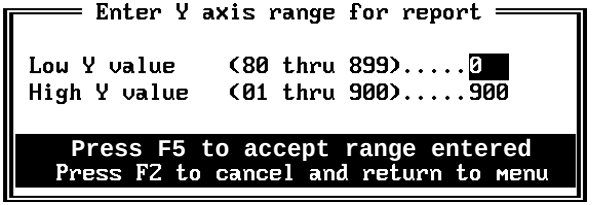
Select the desired option.

- If you select **Print**, the following screen will appear.


Select Registers to Print
Errored Seconds Y
Unavailable Seconds N
Bursty Error Seconds N
Severely Erroed Seconds N
Loss of Frame Counts N
Errored Seconds Line N
Severely Errored Framing N
Out of Frame Seconds N
Press F5 to print registers

Select the performance data registers you want to print by typing **Y** beside each, and press F5 to send the data to the on-line printer.

- If you select **y axis**, then the following screen appears.


Enter Y axis range for report
Low Y value (80 thru 899).....0
High Y value (01 thru 900).....900
Press F5 to accept range entered
Press F2 to cancel and return to menu

This option aids in viewing performance which changes within a narrow range.

Computing statistics

Use these sub-menus to access percentages of available and error-free seconds for the circuit elements you select.

The User and Telco statistics displayed through these options include percentages of available seconds and error-free seconds for the CSU circuit element(s) you select. These statistics are calculated from the user or telco performance data available from the registers for the current 15-minute interval plus up to the previous 96 intervals (24 hours).

- The percentage of available seconds is calculated by dividing the available seconds by the total seconds.

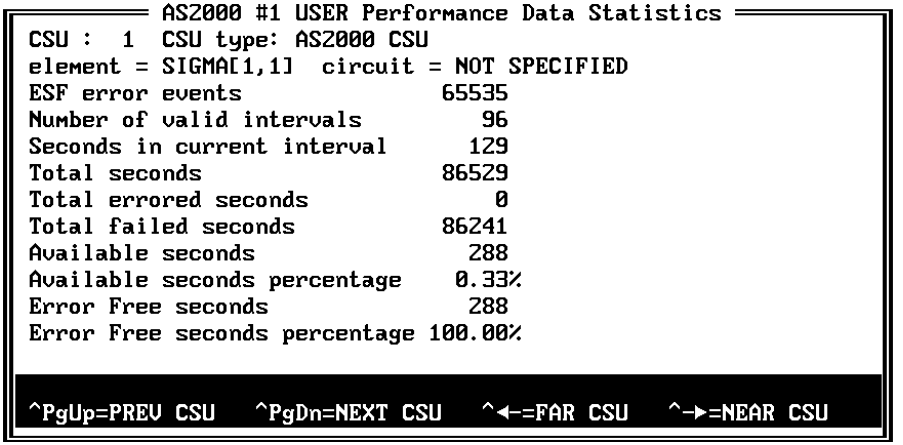
- The percentage of error-free seconds is calculated by dividing error-free seconds by available seconds.

The Telco Statistics display is the same as the User Statistics display, except that the analysis is based on the performance data in the Telco registers, rather than in the User registers.

To access User or Telco Statistics:

1. When you get the *On-line Access* screen, select either **USER Statistics** or **Telco Statistics**.

2. The CSU statistics screen appears.


AS2000 #1 USER Performance Data Statistics
CSU : 1 CSU type: AS2000 CSU
element = SIGMA[1,1] circuit = NOT SPECIFIED
ESF error events 65535
Number of valid intervals 96
Seconds in current interval 129
Total seconds 86529
Total errored seconds 0
Total failed seconds 86241
Available seconds 288
Available seconds percentage 0.33%
Error Free seconds 288
Error Free seconds percentage 100.00%
^PgUp=PREV CSU ^PgDn=NEXT CSU ^←=FAR CSU ^→=NEAR CSU

View all the CSUs in the range.

To access the previous or next CSU circuit element in the range you have selected, use the Ctrl PgUp and Ctrl PgDn key combinations, respectively.

To display the registers of a CSU at the far end via the ESF Data Link, press Ctrl ← after accessing the near-end CSU circuit element.

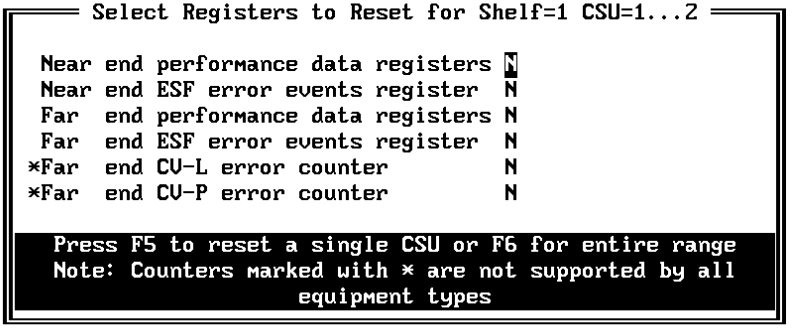
3. This completes the User/Telco Statistics procedure.

Resetting User performance registers

Use this sub-menu to reset User registers. The NCC, CCC, andTAC do not maintain CV-L and CV-P performance data registers.

To reset user performance registers:

1. When you get the *On-line Access sub-menu*, select **`Reset USER Registers`**. The *Select Registers to Reset* screen appears.


Select Registers to Reset for Shelf=1 CSU=1...2
Near end performance data registers N
Near end ESF error events register N
Far end performance data registers N
Far end ESF error events register N
*Far end CV-L error counter N
*Far end CV-P error counter N
Press F5 to reset a single CSU or F6 for entire range
Note: Counters marked with * are not supported by all equipment types

2. Enter **`Y`** for all those registers you wish to reset. Enter **`N`** for those that should not be reset.

- **Near end Performance Data Registers:**

  Include ***User***, ***Additional*** (AS2000 only), and ***EQPT*** (AS2000 only) registers.

  For AS2000, these are NET side: ES, UAS, BES, SES, LOFC, ES-L, SEFS, and OOFS.

  Included for AS2000 CSUs are NET side: LOFS, LOSS, RAIS, AISS, and BERS; and the EQPT side: ES, UAS, ES-L, OOFS, DTED, and DBER registers.

- **Near end ESF Error Events Register:**

  The sum of the following error events: CRC-6 errors and OOF events. (See AT&T54016).

- **Far end CV-L Events Register:**

The Code Violations-Line register. (See ANSI T1M1.3). These registers are not available for reset in the AS2000 or ConnecT1 Plus CSU circuit elements.

- **Far end CV-P Events Register:**

  The Code Violations-Path register. (See ANSI T1M1.3). These registers are not available for reset in the AS2000 or ConnecT1 Plus CSU circuit elements.

CAUTION

Resetting the *1-hour* and *24-hour User Performance Data Registers* affects the collection of data stored in the Performance Data Log. If you do not record this operation in your network management notebook, you are likely to interpret the Performance Data Log incorrectly.

3. Perform one or more of the following:

   - If you want to reset the selected registers in the first CSU in the range, press F5.
   - If you want to reset the selected registers for all the CSUs in the range, press F6.
   - If you want to return to the previous menu without resetting registers, press F2.

   When you press F5 or F6, a reset warning message appears. Confirm that you want to reset the registers and clear the data.

   If the selected set of registers to test are not equipped, an error message to that effect appears after you confirm the reset by typing **Y**.

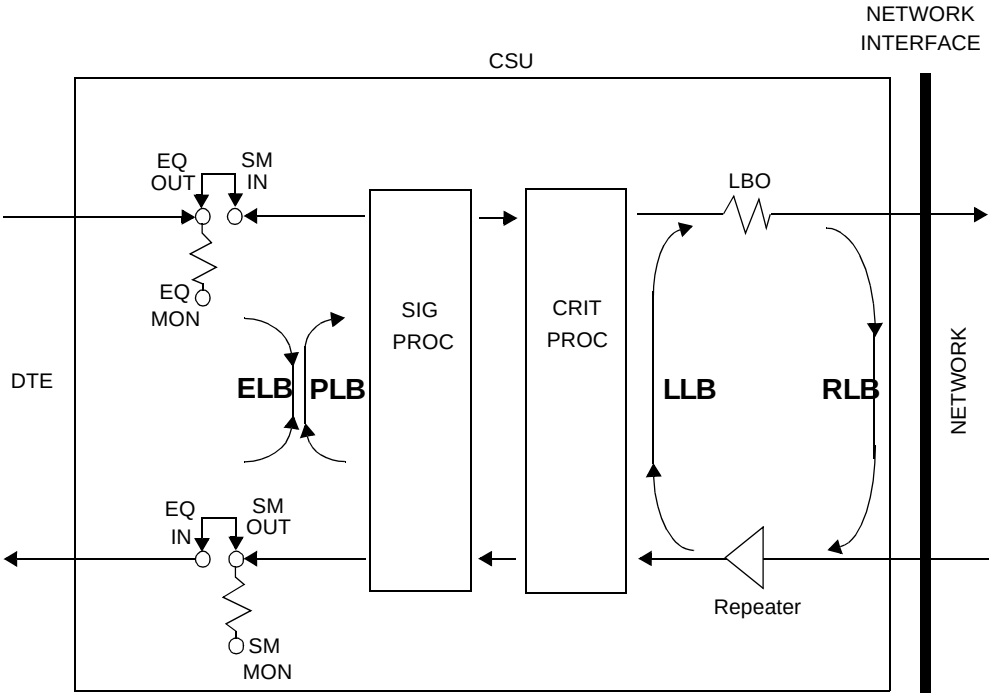
4. This completes the Reset User Registers procedure.

Activating/Deactivating CSU loopback

This section deals with activating and deactivating loopbacks.

CSU loopback descriptions

To help you quickly isolate problems within the transmission path, most of the Verilink CSUs (including NCC, CCC, or TAC) provide the following four basic loopbacks shown in the following diagram.



These include the following loopbacks.

- **LLB**, or Line Loopback
- **PLB**, or Payload Loopback
- **RLB**, or Repeater Loopback
- **ELB**, or Equipment Loopback

All loopbacks can be activated and deactivated via the data port, the diagnostic interface port, or an ESF 4 kbps message received from the far-end CSU or an intra-network device, except as described in the previous section.

PLB - Payload Loopback

When a PLB is in effect, the signal from the DS1 line is looped back to the line. Since the looped signal passes through the CSU (including the repeater), the PLB is useful in testing the CSU from the far end of the circuit. MostVerilink units can be configured to either pass the network signal intact or send an Alarm Indication Signal (AIS, which is unframed ALL-ONEs) to the EQPT during a PLB.

The following LEDs on theVerilink CSUs (NCC 2020, CCC 1020, and TAC 1010) indicate a PLB in progress (SPAN is equivalent to network [NET]):

Equipment	Message
551 VST List 1 551 VST List 1/A	SPAN MM LOOPED
4016 List 1	SPAN MM LOOPED
551 VST List 1/B 551 VST List 2	SPAN NEAR END LOOPED
4016 List 2	SPAN LOOPED
4016-R	SPAN LOOPED
NCC orTAC	NET LED flashes amber

LLB - Line Loopback

When a line loopback (LLB) is activated, the signal from the DS1 network is looped back to the network .

Since the looped signal does not pass through the CSU (except for the repeater and critical protection circuitry), the LLB is useful for testing the DS1 line. All BPVs received from the network are returned on the transmit pair.

Most CSUs may be configured to pass the network signal intact to the EQPT or send unframed ALL-ONEs (i.e., AIS) to the EQPT during loopback.

A far-end LLB can be activated and deactivated via the 4 kbps ESF Data Link or with inband codes sent from the near-end CSU. These inband codes can be generated by all Verilink ESF CSUs except for the 551VST

List 1, 1/A, and 4016 List 1. Note that Access Manager blocks transmission of the inband loop-up and loop-down codes from the far-end CSU to the near-end CSU.

The following LEDs light up on the CSUs (NCCs (CCCs) and TACs) during an LLB (SPAN is equivalent to network [NET]):

Equipment	Message
551 VST List 1 551 VST List 1/A	SPAN INBAND LOOPED
4016 List 1	SPAN INBAND LOOPED
551 VST List 1/B 551 VST List 2	SPAN NEAR END LOOPED
4016 List 2	SPAN LOOPED
4016-R	SPAN LOOPED
NCC orTAC	NET LED flashes amber

If the LLB at the far end is activated by sending the inband loopback code from the near-end CSU, the near-end 551VST List 1/A, List 2, and 4016 List 2 activate their network (NET) Far-End Looped LEDs when inband loop-up code is received back at the near-end CSU. This indicates that the far-end CSU or network is looped back to the near-end CSU.

Note: *Releasing the far-end LLB by any method except sending an inband loop-down code does not extinguish the span (i.e., network) far-end looped LED. If a far-end LLB is activated by a Data Link message, the far-end CSU will not respond to an inband loop down code*

RLB - Repeater Loopback

When a repeater loopback (RLB) is in effect, the signal from the EQPT is looped back to the EQPT through the CSU repeater.

Since the looped signal passes through all CSU circuitry except the network input and output transformers, the RLB EQPT is useful in testing the operation of the CSU locally. The CSU always passes the EQPT signal intact to the network during RLB.

After an operator-defined time, the RLB is deactivated by the RLB timer. This prevents lockout during far-end-initiated loopback via the ESF Data Link. The default value for this *time-out* option varies depending on the type of CSU used. The RLB time-out is in effect regardless of whether the loopback to the near-end or to the far-end was initiated locally at the CSU or remotely via Access Manager.

CAUTION

Performing a far-end RLB locks out any messages from the ESF Facility Data Link.

The CSU front panel EQPT LOOPED LED illuminates while the RLB is in effect. For an NCC 2020, CCC 1020,TAC 2010, and TAC 1010, the EQPT LED flashes amber during an RLB. The 551VST List 1 or 1/A and 4016 List 1 do not have the RLB and respond with the error message, `REQUEST REJECTED BY NODE OF CIRCUIT ELEMEN .`

ELB - Equipment Loopback

When an equipment loopback (ELB) is in effect, the signal from the equipment is looped back to the equipment on the EQPT side of the CSU.

Since the looped signal does not pass through the CSU circuitry, the ELB is useful in testing the operation and connection of the EQPT.Most CSUs can be configured to pass the EQPT signal intact to the network or to send unframed All-ONEs (i.e., AIS) to the network during loopback.

The EQPT Looped LED on the CSU front panel lights while the ELB is in effect. For an NCC 2020, CCC 1020,TAC 2010, and TAC 1010, the STATUS LED flashes amber during an ELB.

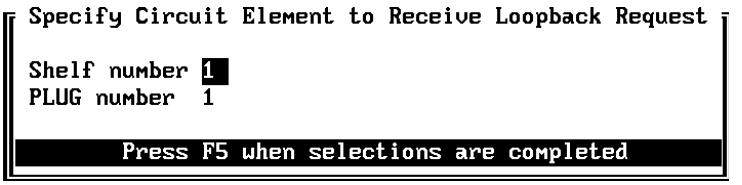
Procedures for loopbacks

Before setting up any loopbacks, you need to verify a timing issue if the CSU is used with a DIU. You must determine the appropriate CSU timing for that loopback. For example, avoid tests with no timing source: when an LLB is set and the network does not supply timing, then NET timing the unlooped CSU is invalid and introduces errors in the test.

To set loopbacks:

1. When you get the *On-line Access sub-menu*, select the **`Loopbacks`** option.

   The *Specify Circuit Element to Receive Loopback* screen appears.

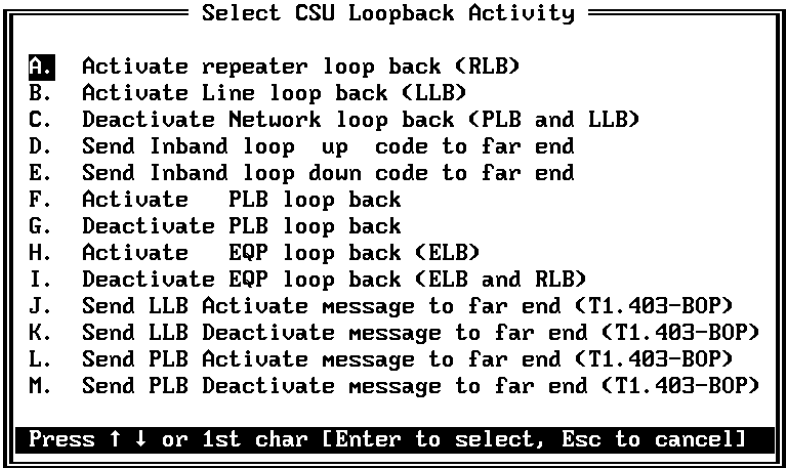

Specify Circuit Element to Receive Loopback Request
Shelf number 1
PLUG number 1
Press F5 when selections are completed

   Single-line CSUs do not present this screen.

   - **CSU Shelf Number:** Enter the shelf number of the plug-in CSU circuit element to receive the loopback request. Only AS2000 or ConnecT1 Plus CSUs, and CSUs in shelves controlled by an NC/E, have a **`CSU Shelf Number`** option.
   - **CSU Plug Number:** Enter the slot number of the plug-in CSU circuit element to receive the loopback request.

2. Press the F5 key to enter the CSU shelf and slot numbers. A *Select Loopback Activity* screen appears.

   - If you are working on an AS2000 or ConnecT1 Plus CSU, you will see the following menu:


Select CSU Loopback Activity
A. Activate repeater loop back (RLB)
B. Activate Line loop back (LLB)
C. Deactivate Network loop back (PLB and LLB)
D. Send Inband loop up code to far end
E. Send Inband loop down code to far end
F. Activate PLB loop back
G. Deactivate PLB loop back
H. Activate EQP loop back (ELB)
I. Deactivate EQP loop back (ELB and RLB)
J. Send LLB Activate message to far end (T1.403-BOP)
K. Send LLB Deactivate message to far end (T1.403-BOP)
L. Send PLB Activate message to far end (T1.403-BOP)
M. Send PLB Deactivate message to far end (T1.403-BOP)
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

- If you are working on a 551VST type CSU, you will see the following menu:

```
Select Loopback Activity

A.  Activate repeater loop back (RLB)
B.  Activate Line loop back (LLB)
C.  Deactivate Network loop back (PLB and LLB)
D.  Send Inband loop  up  code to far end
E.  Send Inband loop down code to far end
F.  Activate   PLB loop back
G.  Deactivate PLB loop back
H.  Activate   EQP loop back (ELB)
I.  Deactivate EQP loop back (ELB and RLB)
J.  Activate   framed all-ones signal to span
K.  Deactivate framed all-ones signal to span

Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]
```

AllVerilink 551VST type CSUs respond to functions **A** through **I** on this menu; the exceptions are the 551VST List 1 and 1/A CSUs and the 4016 List 1 CSU, which respond to functions **F** and **G** only (PLB). When these CSUs are equipped as far-end circuit elements, they respond only to **D** and **E** when these codes are sent from the near-end CSU.

3. Select the CSU loopback operation you want.

4. After choosing a loopback function, the *Specify Near End or Far End* screen appears.

```
Specify near end or far end

Send request to far-end CSU ? N

   Press F5 to initiate test
   Press F2 to cancel
```

5. Enter **N** for the near-end CSU to receive the loopback request, or enter **Y** for the far-end CSU to receive the request. This menu does not appear if you choose the **Send Inband Loop Up** or **Send Inband Loop Down** option.

6. Press F5 to execute the loopback command, or press F2 to cancel it.

7. If you are deactivating a loopback and you previously changed the CSU timing, restore the timing to its original mode.

8. If you are activating a loopback, a warning message appears telling you that the selected test will place the DS1 line out of service .

```
WARNING!

This test or loop request will take the line out of service!
Press 'y' to proceed. Any other response will cancel the request.
```

   A prompt also appears, asking you to confirm that you want to proceed with the loopback. To do so, type **Y**. Any other response aborts the test.

9. All loopbacks you have activated remain active until you deactivate them, with the exception of RLB. The RLB time-out was set when you configured the CSU. If the RLB time-out was set to the value **FOREVER**, it does not time out.

CSU loopback options

Access Manager allows you to activate or deactivate a loopback on a CSU circuit element for DS1 circuit troubleshooting purposes. Each CSU circuit element has loopbacks at four locations along the circuit path.

Activate Repeater Loopback (RLB)

The repeater loopback (RLB) connects the CSU output signal back toward the equipment (EQPT). It loops the whole CSU (except the CSU network input and output transformers) toward the EQPT. This loopback has a time-out that automatically releases the loopback after the time selected. This time-out is programmable from Access Manager.

Activate Line Loopback (LLB)

The line loopback (LLB) connects the incoming signal from the network (NET) back to the network at a point just after the CSU repeater. It includes only the NET-side repeater and the network-side critical circuitry in the loopback.

Deactivate Network Loopback (PLB or LLB)

This command deactivates the LLB or payload loopback (PLB) in the direction of the network.

Send Inband Loop-Up Code To Far End

This command causes the near-end CSU to send the industry-standard inband loop-up code to the far-end CSU.

Send Inband Loop-Down Code To Far End

This command allows the near-end CSU to send an inband loop-down code to the far-end CSU.

Activate PLB

This command causes the CSU to activate the PLB toward the network (NET). This loopback is performed just inside the input/output transformers on the EQPT side of the CSU. The PLB therefore includes most of the CSU circuitry in the looped path.

Deactivate PLB

This command deactivates a PLB in progress.

Activate EQPT Loopback (ELB

This loopback loops the CSU toward the EQPT just inside the input/ output transformers on the EQPT side. As most of the CSU circuitry is bypassed by this loopback, ELB is useful for testing theEQPT-to-CSU cabling.

Deactivate EQPT Loopback (ELB and RLB)

This command deactivates an ELB or RLB in progress.

Activate Framed ALL-ONEs Signal To Network

This command causes framed ALL-ONEs test signal to be transmitted to the network. This signal can be used in conjunction with a far-end LLB or PLB to do limited testing of the network and far-end CSU. An upgraded

firmware revision in the CSU is required to use this feature. If you hav an NCC 2020 or CCC 1020 and TAC 2010 or TAC 1010, this function is available from the **`On-line Select Test`** Menu.

Deactivate Framed ALL-ONEs Signal To Network

For 551VST type CSUs, this command deactivates the framed ALL-ONEs test signal activated by the **`Activate`** option above.

Send LLB or PLB Activate Message to Far End (T1.403)

These options are available only for the NCC 2020 or CCC 1020 and TAC 2010 or TAC 1010 of Access System 2000 type nodes. Each option activates an LLB or PLB at the far-end NCC, CCC, or TAC by sending it an ANSI T1.403-compatible bit-oriented message on the ESF Data Link.

Send LLB or PLB Deactivate Message to Far End (T1.403)

These options are also available only for NCC, CCC, or TAC. They deactivate the LLBs or PLBs previously activated via the T1.403 loop-up messages above.

Note: *If the framed ALL-ONEs signal is being transmitted, send inband codes will not work; use options (Activate LLB) and/or C (Deactivate PLB and LLB) instead. However, this procedure does not work if the far-end CSU is a 4016 List 1 or 551VST List 1/A. In these cases, you must first deactivate framed ALL-ONEs signal (option K); then transmit the inband code (options D and E) and finally restore framed ALL-ONEs (option J).*

Activating/Deactivating DIU loopbacks

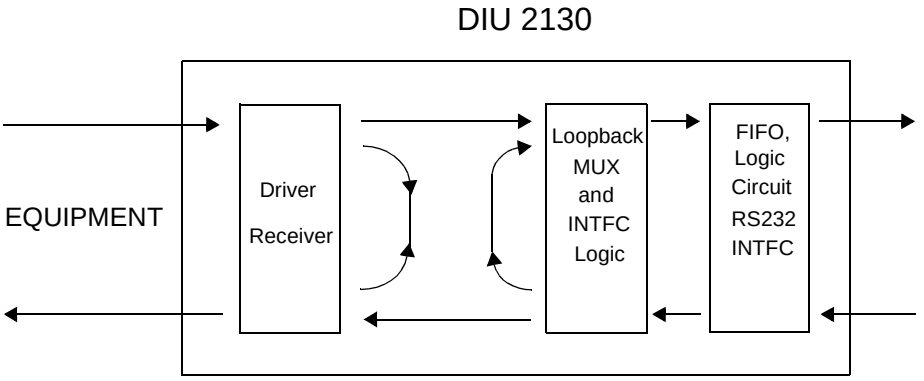
This section provides a description of DIU loopbacks and the procedure for activating and deactivating them.

Loopback descriptions

The data port loopback of a DIU affects only the data ports on which it is activated. All other data ports of the DIU remain uninterrupted.

DIU 2130 and DIU 1130 loopbacks

The DIU 2130 and DIU 1130 loopbacks are shown in the following figure:



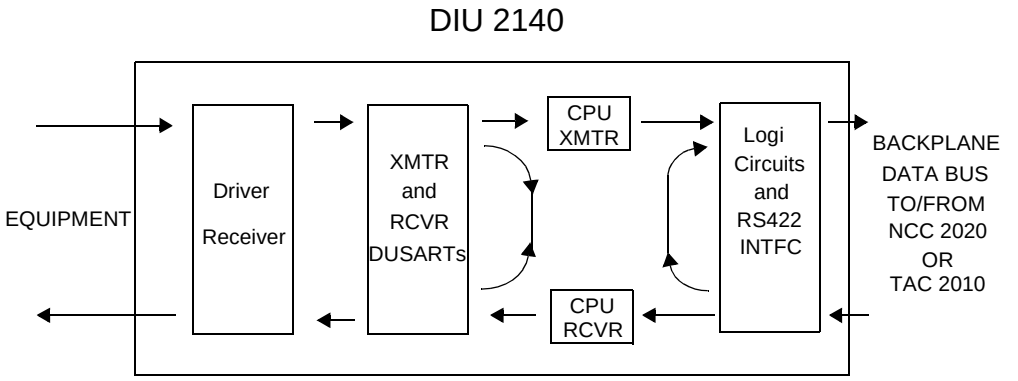
The selected data equipment transmitter output is connected to the receiver through the associated interface driver and receiver in the DIU. This looping path allows you to check the operation of the data equipment and associated cabling to the DIU.

At the same time, the data port of the DIU is also looped back to the DS1 network and returned to the far-end EQPT. This path allows you to perform end-to-end data port tests and to check the data circuit end-to-end.

DIU 2140 loopbacks

The DIU 2140 loopbacks are shown in the following figure:

Figure 8-1 DIU 2140 loopbacks



The selected data equipment transmitter is connected to the data receiver through the associated interface driver and receiver in the DIU. This looping path allows you to check the operation of the data equipment and associated cabling to the DIU. The data port of the DIU is also looped back toward the far-end EQP. This path allows you to perform end-to-end data port tests and check the EQPT circuit end-to-end.

Procedure for loopbacks

Before starting this procedure, determine the appropriate CSU timing for the DIU loopback. For example, avoid split timing: when a DIU loopback is set, **THROUGH** timing with non-synchronized timing sources for *receive* data and *transmit* data is invalid and introduces errors.

In general, DIU loopbacks may introduce errors if the CSU is **THROUGH** timed.

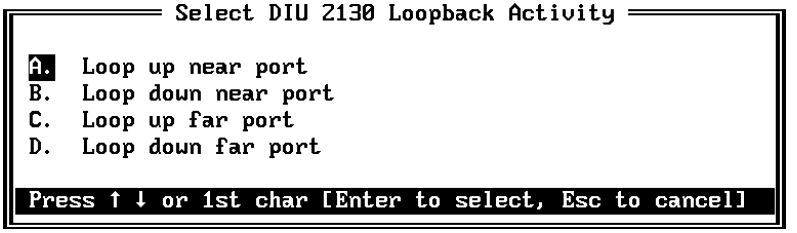
To activate or deactivate DIU loopbacks

1. When you get the *On-line Access sub-menu*, select the **Loopbacks** option.
2. The *Specify Circuit Element to Receive Loopback* screen appears.
   - The first field is **DIU Shelf Numbe** . Enter the shelf number of the plug-in DIU circuit element which will receive the loopback request.
   - The second field is **DIU Plug Numbe** . Enter the slot of the plug-in DIU circuit element which will receive the loopback request.

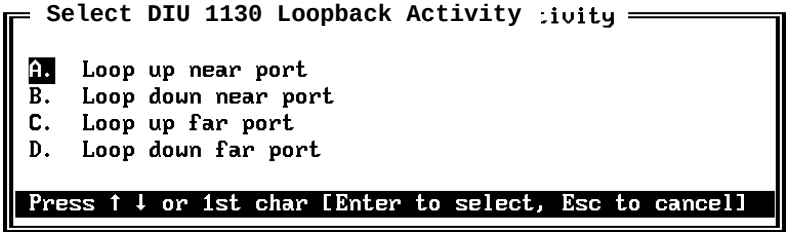
- Press the F5 key to enter the DIU slot and shelf number.

3. One of the following *Select xxx Loopback Activity* screens will appear:

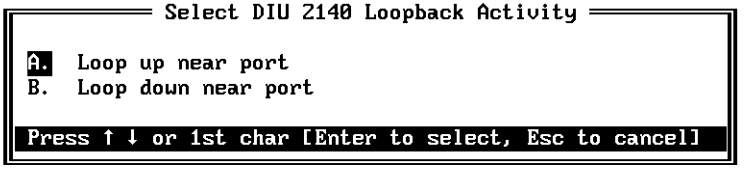
   - For the **DIU 2130**:


Select DIU 2130 Loopback Activity
A. Loop up near port
B. Loop down near port
C. Loop up far port
D. Loop down far port
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

   - For the **DIU 2140**:


Select DIU 1130 Loopback Activity
A. Loop up near port
B. Loop down near port
C. Loop up far port
D. Loop down far port
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

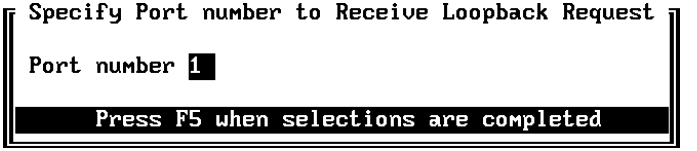
   - For the **DIU 1130**:



Select the DIU loopback operation you want.

The DIU 2130, DIU 1130, and DIU 2140 of an Access System 2000 node are each equipped with two simultaneous loopbacks for data port (i.e., data channel) end-to-end testing.

After selecting the loopback activity, the *Select Port Number to Receive Loopback Request* screen appears.



4. Select the data port to loop up by typing its number (1 or 2 for a DIU 2130 or DIU 1130;1, 2, 3, 4 or 5 for a DIU 2140) and pressing F5, or press F2 to cancel the operation.

5. If you are activating a DIU loopback, a warning message now appears telling you that the selected test will place the data port out of service. A prompt also appears, asking you to confirm that you want to proceed with the loopback. To do so, type **Y**. Any other response aborts the test.

6. If you are deactivating a DIU loopback and previously changed the timing mode of the CSU, restore the CSU to its original timing.

7. All loopbacks you have activated (i.e., loop up) will remain active until you deactivate (i.e., loop down) them.

Testing CSUs

This procedure applies to AS2000 CSU circuit elements only.

If the CSU is used with a DIU, and a CSU loopback is required, determine the appropriate CSU timing for that loopback. For example, avoid tests with no timing source: when an LLB is set and the network does not supply timing, then NET timing the unlooped CSU is invalid and introduces errors in the test.

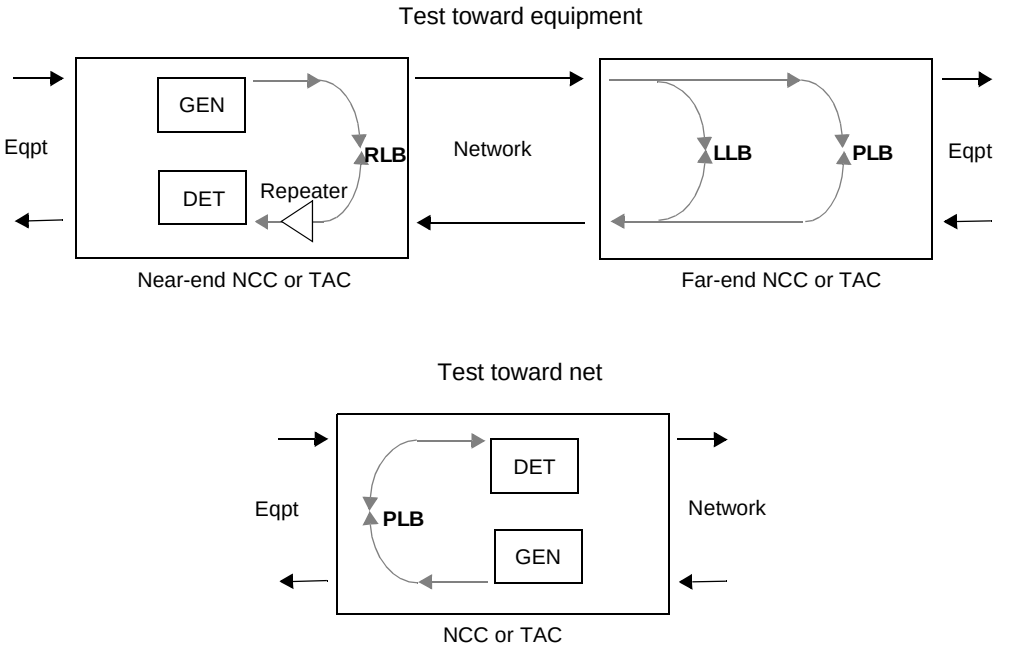
When this test is complete, you will remove the loopback and restore the CSU to its original timing.

You will then configure the CSU timing that is required for this test.

You will activate the CSU loopback that is required for this test. For example, when sending a test signal toward the NET (network), an RLB is first activated at the near-end NCC or TAC. An LLB or PLB can be activated at the far end. As another example, when a test signal is sent toward the EQPT (equipment), a PLB is first activated at the near end.

This T1 test signal application is shown in the figure below

Figure 8-2 Applying a T1 test signal



GEN = Test Signal Generator
DET = Error Detector / Counter

To test an AS2000 CSU

1. When you get the *On-line Access sub-menu*, select the **`Select Test`** option. The *Specify Circuit Element to Receive Test Request* screen appears.

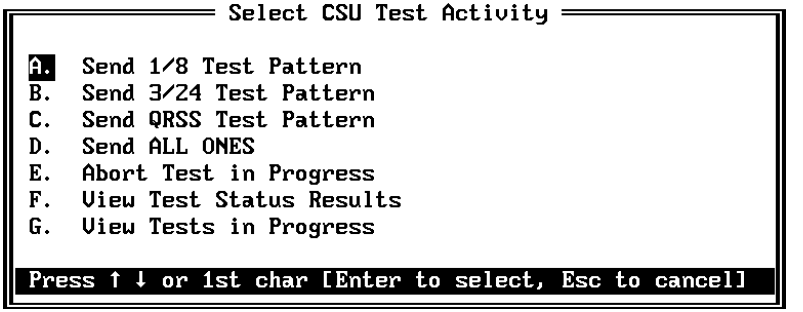
2. Enter the shelf in which the desired NCC or TAC is located. This number can be from 1 to 4 in each Access System 2000 node or

from 1 to 2 in each ConnecT1 Plus node. For this test, this CSU is the near-end CSU.

3. Enter the plug-in slot number (i.e., the number of the circuit element) of the NCC or TAC. This number depends on the shelf number selected above and is within the range below. Press **F5** to accept the shelf and slot (plug) numbers.

   - Multiline Shelves: 1 to 13
   - Dual-line Shelves: 1 to 2

   The *Select CSUTest Activity* screen appears.


Select CSU Test Activity
A. Send 1/8 Test Pattern
B. Send 3/24 Test Pattern
C. Send QRSS Test Pattern
D. Send ALL ONES
E. Abort Test in Progress
F. View Test Status Results
G. View Tests in Progress
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

4. Select the desired option.

   - To send a test signal, select an option from **A** through **D** and continue. Each of these test signals (options) are described in the following paragraphs.
   - The NCC or TAC reports the error count to Access Manager during the test. You can view the results of the test while it is in progress or after the test is completed. To view results at any time, continue with Step 11.
   - To abort a test, continue with Step 7.

   Options **A** through **D** in the *Select CSUTest Activity* menu correspond to test signals that the NCC or TACmay apply to a DS1 circuit: You can send each test signal toward either the equipment side or the network side of the NCC or TAC.

These signals are either framed or unframed, depending on how you configured the NCC or TAC in the *Enable Testing Options* screen when you configured the CSU. Furthermore, how you configured the NCC or TAC determines whether these inband test signals are permitted at all.

- **1-in-8 ONEs:** A stress pattern with a single pulse in every 8-bit sequence. This signal checks a circuit's ability to function under low-density conditions.
- **3-in-24 ONEs:** A stress pattern containing three pulses in every 24-bit sequence. It tests the ability of a circuit to function under extremely low-density conditions.
- **Quasi-random Signal (QRSS):** A 2^{20} - 1 randomized bit sequence modified according to AT&T TR-54016. This signal exercises the circuit with a varying pattern of ONEs and ZEROs. If the QRSS is applied unframed, it is limited to 14 consecutive ZEROs. If applied framed, it is limited to 15 consecutive ZEROs.
- **ALL-ONEs:** A keep-alive signal sent in the desired direction.

Whichever test signal is chosen, if it is sent toward the net, then the equipment receives an AIS (All-ONEs) signal.

5. After selecting a test operation, the *CSU Test Options* screen appears.

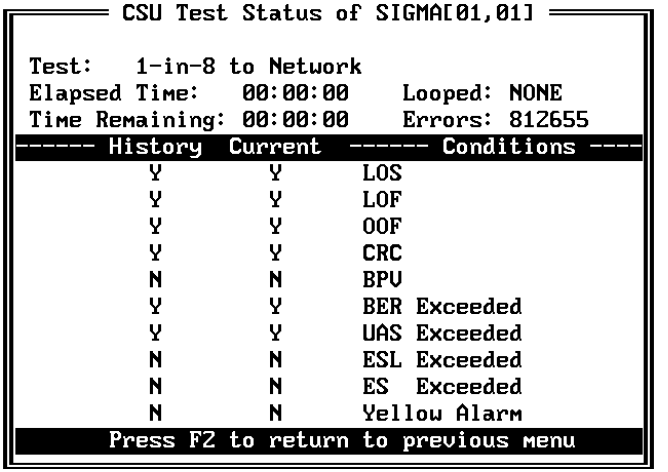
```
CSU Test Options

Test Duration                    15 SEC
To Network or Equipment (N/E)    N
Test From Far End (Y/N)          N

      Press F5 to initiate test
   Press F2 to return to previous menu
```

Enter the **`Test Duration`** (i.e., the period of time for which to apply the test signal). This can be done in one of the following ways:

- A specific time interval in `xx SEC`, `xx MIN`, `xx HR` (up to 24), or `FOREVER`.
- To apply the test signal toward the network, type **`N`**.

- To apply the test signal toward the equipment, type **E**.
- **Test from Far End** should be **Y** if you want the far-end CSU to send the test signal or **N** if you wish the near-end CSU to send the test signal. In either case, the CSU must be an NCC 2020, CCC 1020, or TAC.
- Press F5 to accept the selected values. The test begins when you type **Y** at the warning prompt, whereupon the test signal is applied in the chosen direction and any errors detected by the NCC (CCC) or TAC are counted and recorded.

After the test begins, the CSU Status results will be displayed for every test pattern option, as in the screen below.


CSU Test Status of SIGMA[01,01]
Test: 1-in-8 to Network
Elapsed Time: 00:00:00 Looped: NONE
Time Remaining: 00:00:00 Errors: 812655
History Current Conditions
Y Y LOS
Y Y LOF
Y Y OOF
Y Y CRC
N N BPV
Y Y BER Exceeded
Y Y UAS Exceeded
N N ESL Exceeded
N N ES Exceeded
N N Yellow Alarm
Press F2 to return to previous menu

6. If you are not using a loopback to return the test signal to the transmitting CSU, repeat Steps 1 through 4 for the second CSU (far end), using the same test pattern. After both CSUs are transmitting, synchronize both CSUs by repeating Steps 1 through 4 for the first CSU. Because the initial and ending conditions are not in synch for both transmitters, the final error count is disregarded.

7. Use the **Abort Test in Progress** option if you wish to abort a test in progress; however, the CSU sending the test pattern must be near-end. Select the **Abort Test in Progress** option of the *Select CSUTest Activity* screen. Then, select the near or far end.

The test signal is no longer applied to the circuit by the NCC (CCC) or TAC, and all loopbacks are deactivated. If you select this option, the test procedure is completed.

8. If you selected one of the **`View`** options, continue with this step.

   - If you selected **`View Test Status Results`** (from the *SelectTest Activity* screen), you are prompted to select the near-end or far-end CSU. Enter your selection, and press (F5). Go to Step 9.
   - If you selected **`View Test in Progress`**, go to Step 11.

9. The *CSU Test Status* screen is updated during the test once every 5 seconds (+/- 1 second). The status of this test can also be updated at any time by pressing and releasing any key (except F2 or ESC). The following results are displayed in the *CSU Test Status Results* screen.

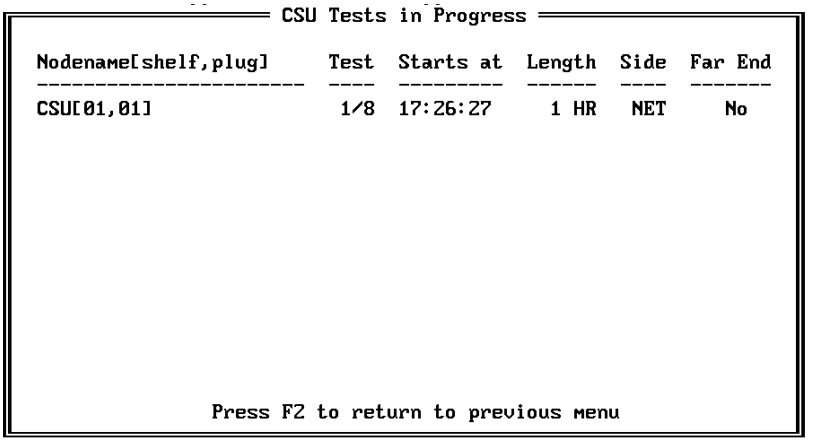
```
CSU Test Status of SIGMA[01,01]

Test:   1-in-8 to Network
Elapsed Time:   00:00:00    Looped: NONE
Time Remaining: 00:00:00    Errors: 812655
------ History  Current  ------ Conditions ----
         Y        Y      LOS
         Y        Y      LOF
         Y        Y      OOF
         Y        Y      CRC
         N        N      BPV
         Y        Y      BER Exceeded
         Y        Y      UAS Exceeded
         N        N      ESL Exceeded
         N        N      ES  Exceeded
         N        N      Yellow Alarm
      Press F2 to return to previous menu
```

This screen displays the currently running test or, if no test is currently running, the results of the previous test.

- **Test:** The first line shows the type of test signal currently being applied and the direction of the signal.
- **Elapsed Time:** The amount of time which the screen has been displayed.

- **Test Time Remaining:** This line shows time in hours, minutes, and seconds (hh:mm:ss) that the CSU will be generating the test signal. When the timer reaches 00:00:00, the test generation will be disabled and error counting will stop.
- **Looped:** Indicates which near-end loop is in effect (LLB, PLB, ELB, or RLB). Although different loopbacks may be used concurrently, only the relevant loop to the CSU test will be displayed.
- **Errors:** This shows the number of errors which the NCC (CCC) or TAC has detected in the incoming test signal.
- **Lower Screen Section:** Shows the monitored condition of the received signal. This screen only shows what type of error is occurring; it does not indicate what is causing the error. A green **N** under the current column indicates that no errors are occurring for the listed condition. A red **Y** indicates a testing or error condition.

10. Press (F2) to return to the *SelectTest Activity* screen.
11. The list of CSU circuit elements which are accumulating test results are displayed on the *CSU Tests in Progress* screen.



Each CSU circuit element is listed with the test it is performing. Access Manager keeps track of up to 13 separate tests.

Test entries are deleted in three ways:

- After the results have been viewed if no (0) time is remaining.
- When the system is shutdown and restarted again.
- When more than 13 tests are running concurrently, only the last 13 test entries are retained.

12. Press F2 to return to the *SelectTest Activity* screen.
13. If the configuration was changed in order to run this test, restore your configuration now

Testing DIUs

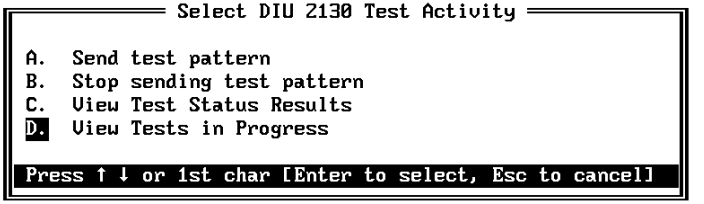
You can also use Access Manager to perform end-to-end tests on a data port of a DIU 2130 in an Access System 2000 node. The following tests options are available for DIUs:

You can apply a ***pseudo-random bit sequence*** (PRBS) test signal on a data port under test. This four-bit pattern can be used to check circuit continuity on an end-to-end basis.

Sending a test signal

To apply a PRBS test signal to a data port of a DIU 2130 (DIU 1130):

1. When you get the *On-line Access sub-menu*, select the **Select Test** option.
2. Select the DIU to apply the PRBS by entering its shelf and plug-in slot numbers and pressing F5. A *Select DIUTest Activity* screen appears.


Select DIU 2130 Test Activity
A. Send test pattern
B. Stop sending test pattern
C. View Test Status Results
D. View Tests in Progress
Press ↑ ↓ or 1st char [Enter to select, Esc to cancel]

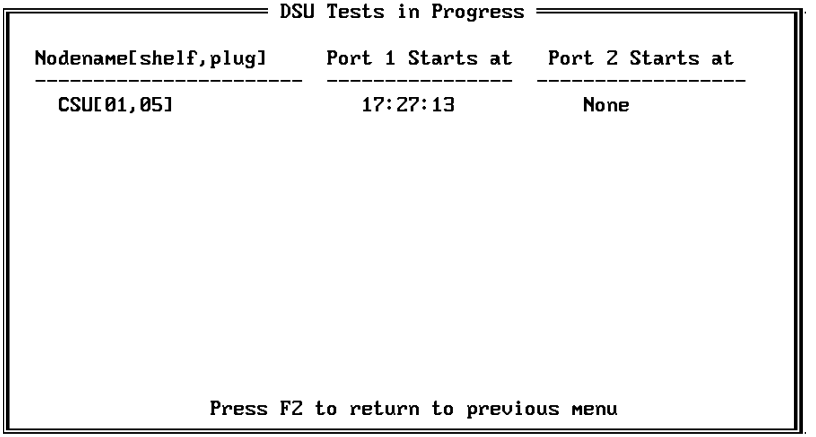
3. Choose the **Send Test Pattern** option in the *Select DIUTest Activity* screen by typing **A** or highlighting this option and pressing Enter.

4. Select the data port on which to send the PRBS. For a DIU 2130 or DIU 1130, this can be Port 1 or 2. A warning message appears.

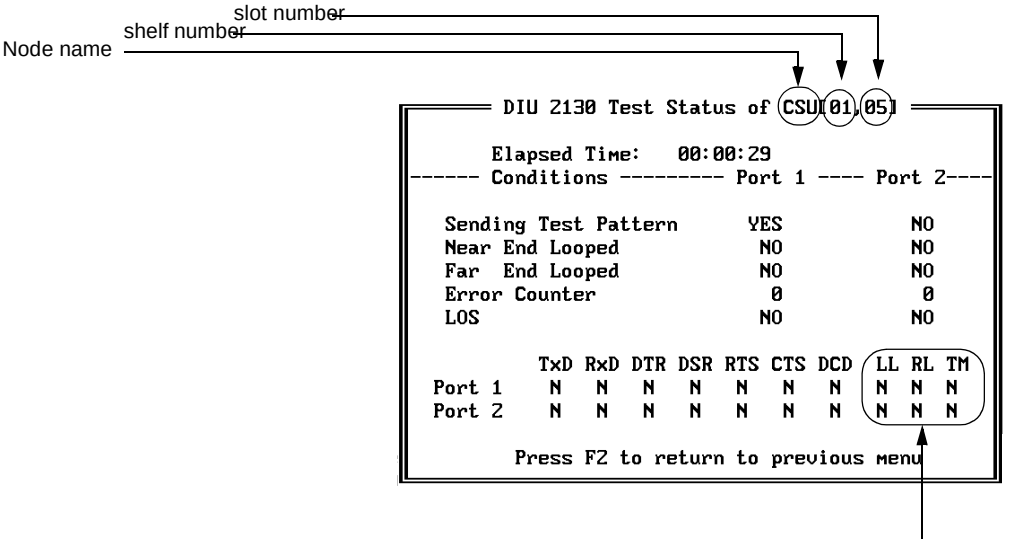
5. Press **Y** to begin testing. The selected data port is now placed out of service and the PRBS is applied to it. All other data ports are unaffected and continue to operate normally.

6. To stop sending the PRBS, select the **Stop Sending Test Pattern** option from the *Select DIUTest Activity* screen. The data port is now restored to normal service.

7. To view tests in progress, select the **Stop Sending Test Pattern** option. The *DSU Tests in Progress* screen appears.



8. To view DIU test results, select the **`Stop Sending Test Pattern`** option. The *DIU 2130 Test Status* screen appears.


slot number
shelf number
Node name
DIU 2130 Test Status of CSU 01 05
Elapsed Time: 00:00:29
Conditions
Port 1
Port 2
Sending Test Pattern YES NO
Near End Looped NO NO
Far End Looped NO NO
Error Counter 0 0
LOS NO NO
TxD RxD DTR DSR RTS CTS DCD LL RL TM
Port 1 N N N N N N N N N N
Port 2 N N N N N N N N N N
Press F2 to return to previous menu
V.54 data channel loopback detection

The DIU 2130 can now detect the three V.54 leads which equipment can use to activate data channel loopbacks. The definitions are as follows:

- **LL:** The data channel loopbacks on the DIU 2130 at the local node (the node to which the DTE sending LL is connected).
- **RL:** The data channel loopbacks on the DIU 2130 on the far end of the network connection.
- **TM:** This is set high by the DIU 2130 upon successfully activating LL or RL to notify the DTE of its current state.

Appendix

A

Key Acronyms and Terms

Term	Definition
A	
A	Ampere.
AC	Alternating Current.
Acknowledged Alarm	An alarm sent to Access Manager which has been acknowledged manually by the user or automatically by the software.
Adjacent Channels	If two channels are assigned so there is no unassigned channel between them, these channels are said to be adjacent. (For example, if P ort1 = Channels 2, 3, 5, 7-9 and Port 2 = Channels10, 2 4 ; then 2 is adjacent to 3, 7 is adjacent to 8, 8 is adjacent to 9, 9 is adjacent to 10, and 24 is adjacent to 1.)
AIS	See Alarm Indication Signal.
Alarm Indication Signal	An unframed ALL-ONEs bit pattern that indicates that an alarm condition exists upstream in a circuit leading to the downstream equipment. This is also called an *ALL-ONEs Keep-Alive* or *Blue Alarm* Signal.
AISS	See Alarm Indication Signal Second.
Alarm Indication Signal Second	A second during which the CSU receives an ALL-ONEs (AIS) code from the network.
ALL-ONEs	A signal on a DS-1 (T1) line which is comprised entirely of ones (11111111). This signal is transmitted when there is an alarm condition upstream on the network or as a keep-alive signal to the network from a CSU.
Alternate Mark Inversion	A 1.544 Mbps signal in which successive ONEs (pulses) are normally of alternating polarity and in which ZEROs (spaces) are of zero amplitude.

Term	Definition
AMI	See Alternate Mark Inversion.
ANSI	American National Standards Institute.
ASCII	American National Standard Code for Information Exchange.
Asynchronous	A type of transmission that is not related to a specific frequency, or to the timing of the transmission equipment. Messages are controlled with start and stop bits from which the receiver calculates the necessary timing.
Auto-configure	Automatic configuration of the serial communication port to match the device connected to it. Term used to describe either when Access Manager configures its COM ports or when a node configures its network management port.
Available Second	Any second that is not a failed or unavailable second (UAS).
B	
B8ZS	See Bipolar Eight-Zero Substitution.
Baud Rate	In data transmission, the reciprocal of the length in seconds of the shortest pulse used; for instance, a system whose shortest pulses are 1/300 second is operating at 300 baud.
BER	See Bit Error Rate.
BERS	See Bit Error Rate Alarm Seconds.
BES	See Bursty Errored Seconds.
Bit	A binary digit, either zero or one.
Bit Error Rate	The ratio of bits received in error to the total number of bits transmitted. The time over which this rate is calculated is not inherent to the definition and can be separately specified. For low error rates, the Cyclic Redundancy Check (CRC) can be used to estimate the BER, assuming that not more than one error will occur per ESF.
Bit Error Rate Alarm Seconds	A count of one-second intervals during which a bit error rate alarm existed.

Term	Definition
Bit Error Rate Threshold	A bit error rate (BER) level above in which a CSU alarm is generated and reported to Access Manager 2000.
Bipolar Eight-Zero Substitution	A physical layer of protocol for implementing a pattern that replaces eight consecutive ZERO bits. This pattern includes two intentional bipolar violations (BPVs) that would otherwise indicate transmission errors. Using B8ZS allows for 64 kbps per DS-0 with unlimited zeros.
Bipolar Violation	A violation of the T1 bipolar AMI transmission pattern requiring successive ONEs (pulses) to be transmitted as pulses of opposite polarities. BPVs normally indicate transmission errors. B8ZS patterns contain intentional BPVs, which are not counted as errors.
Bipolar Violation Count	The number of bipolar violations (BPVs) occurring over a given period of time.
Blue Alarm Signal	See ALL-ONEs.
Bps	Bits per second; a basic unit of measure for serial data transmission. kbps (kilobits per second) indicates a transmission rate of 1000's bps
BPV	See Bipolar Violation.
Bursty Errored Second	A second having between 2 and 319 CRC-6 (Cyclical Redundanc Checksum) error events.
Byte	In most cases, an 8-bit quantity of information used mainly in parallel data transfer or data storage. Also referred to as an *octet.*
C	
Cable	An assembly of one or more conductors within a protective sheath, made so as to permit the use of the conductors separately or in groups.
Carrier Registers	These registers store the previous 24 hours' performance monitoring data accumulated as ESs, UASs, BESs, SESs, and LOFCs, plus the current interval's ESs, UASs, BESs, SESs, and LOFCs. There is also an ESF Error Event register, which provides a continuous count of ESF error events. The carrier registers can be read by both the carrier (telco) and end user, but they can be reset only by the carrier.
Channel	In communications, a physical or logical path allowing the transmission of information to flow from point-to-point.

Term	Definition
Channel Service Unit	The portion of the NCC or TAC that performs CSU functions, such as line framing and coding conversions, alarm transcoding, performance data storage and processing, alarm reporting, and circuit loopback and test signal application operations.
Circuit	A circuit consists of any two network circuit elements and the interconnecting T1 facility, that have Access Manager 2000 access in a T1 network.
Circuit Configuration	A set of circuit element attributes describing the locations of nodes and equipment in a circuit.
Circuit Element	A circuit element is a single module of the parent node to which Access Manager 2000 is connected. If the parent node is a multiline module, such as an AS2000 type, a circuit element is one of the plug-ins in one of shelves controlled by the node; it is identified by the parent node's Node Name and a [shelf, slot] index. The shelf index is identical to the shelf address set during the hardware installation.
Circuit Name	The name for a circuit supplied by a user of Access Manager 2000.
Clear	(1) To reset the auto-acknowledged alarms counter to zero. (2) A trouble condition that no longer exists.
Clock	An oscillator-generated signal that provides a timing reference for a transmission link.
Code Violation - Line	For an AMI-coded signal, this is a bipolar violation BPV occurrence. For a B8ZS-coded signal, this is the occurrence of aBPV, which is not a zero-substitution code.
Code Violation - Path	When SF (D4) framing is used, this is a framing error. For ESF framing, this is a CRC-6 error
Connector	A physical interface, such as DA-15 or DC-37, typically with male and female components.
CRC-6	See Cyclic Redundancy Check.
CRC-6 Error Event	Occurs when the CRC code in a received ESF signal fails to match the CRC code calculated locally by the CSU. A CRC-6 error event indicates that at least one bit of the frame has not been received correctly.

Term	Definition
CRC-6 Regeneration	A mode in which the CRC-6 is recalculated for incoming data before it is retransmitted. In this mode, any incoming CRC-6 errors are not propagated (although the data may be corrupted).
CSU	See Channel Service Unit.
CSU Slot Number	The plug-in slot location of a CSU in a multiline or dual-line shelf.
CTS	ClearTo Send.
Current	The amount of electrical charge flowing past a specified circuit point per unit of time. See Ampere (A).
Current Status	An indication of current line and/or circuit element status, including CSU signal state and Payload Loopback (PLB) status.
CV-L	See Code Violation - Line.
CV-P	See Code Violation - Path.
Cyclic Redundancy Check (1)	A check sum indicator, which is based on the remainder of a polynomial calculation performed on the transmitted data, that is used to verify, with some fixed probability of correctness, whether that data was corrupted.
Cyclic Redundancy Check (2)	This code is embedded in the ESF format and derived from a mathematical calculation performed on the data bits of an Extended Superframe (ESF) field (all 4632 bits) to obtain a six-bit Cyclic Redundancy Checksum (CRC-6) code for those data bits. The near-end DTE or ESF CSU transmits these six bits in the appropriate CRC-6 positions of the next ESF field across the facilities to the far-end DTE or ESF CSU. The CRC-6 code is recalculated by the far-end CSU (based on the current ESF field received) and then compared to the CRC-6 that was originally transmitted. If the two CRC-6s match, it is highly probable that the ESF field arrived without error. If the CRC-6s do not match, one or more errors may have occurred during transmission of that particular ESF field. The CRC-6 code is capable of detecting 98.4% of all ESFs containing transmission errors. These error events are logged into an internal register within the ESF CSU and may be recalled on a last 24-hour basis from the local or remote CSU through the ESF Data Link using Access Manager 2000.

Term	Definition
D	
D4	See Superframe.
Data	Digitally represented information which includes voice, text, video, or facsimile.
Data Bus	(1) A common connection using one or more conductors by which data and timing information are conveyed between a related group of devices (e.g., NCC, DIU, TIU). (2) The means by which data and timing information are conveyed between a CSU and associated DIUs. The backplane of each system shelf provides three data buses (or 7 data buses with the MLS 2200) that can be assigned to individual CSUs for DIU interfaces.
Data Channel	The internal circuit path through the DIU, including the data equipment and network assigned time slots.
Data Circuit-terminating Equipment	Data Circuit Terminating Equipment (incorrectly, data communication equipment): Equipment that is either part of the network, an access point to the network, a network node, or equipment at which the network circuit terminates. DIU 2140 / DIM 2232 or possibly HLM 2035, depending on its configuration.
Data Equipment	The customer's data equipment that is connected to a DIU 2130 or DIU 2140 for network transmission through an NCC or TAC for transmission over a T1 network.
Data Interface Module	A backplane interface module of a data interface Unit (DIU) in Access System 2000 which allows V.35 and other wiring formats to be connected from the customers equipment into the DIU.
Data Interface Unit	A device that interfaces T1 data equipment ports at the customer's premises with a NCC or TAC over a T1 network.
Data Link	See *ESF Data Link.*
Data Port	The physical connection on the DIU that allows data from the data equipment to enter the DIU.
Data Service Unit	A DSU is a multiplexer that apportions the 24 channels of a DS-1 (T1) (not necessarily of equal size).

Term	Definition
Data Terminal Equipment	Generally, user devices, such as terminals and computers, that connect to data circuit-terminating equipment (DCE); they either generate or receive data carried by the network.
DC	Direct Current.
DCE	See Data Circuit-terminating Equipment.
DDS	Dataphone Digital Service (AT&T). A private line digital service offered with data rates typically at 2.4, 4.8, 9.6, 19.2, and 56 kbps.
Decibel (dB)	A measure of the relative strength of two signals. The number of decibels is ten times the log of the ratio of the power of two signals or 20 times the log of the ratio of the voltage of two signals.
Digital Signal Level 0	This term describes the signal carried on a lower than T1 speed carrier facility, specifically, a 64 kbps rate signal.
Digital Signal Level 1	This term describes the 1.544 Mbps digital signal carried on a T1 or higher-order carrier facility. There are 24 DS0s in a T1 line. Each DS0 is capable of 64 kbps or 56 kbps signal transmission.
Digital Data Service (DDS)	A digital communications service which carries data at 56 kbps.
Digital Multiplexer/ Demulitplexer	A digital multiplexer takes several lower speed digital lines (channels) and combines them into one faster digital line (channel/signal). A digital demultiplexer device which takes a digital line and divides it into several usable channels.
DIM	See Data Interface Module.
DIU	See Data Interface Unit.
DLS	See Dual-Line Shelf.
DSU	See Data Service Unit.
DS-0	See Digital Signal Level 0.
DS-1	See Digital Signal Level 1.

Term	Definition
DS-1 Equipmen	The customers DS-1 data transmission equipment connected to the CSU of a NCC 2020 or TAC 2010.
DTE	See Data Terminal Equipment.
DTR	Data Terminal Ready.
Dual-Line Shelf	A dual-line shelf is a component of the Access System 2000 and is used to house two or less plug-in modules such as NCCs, TACs, TIUs, and DIUs. The DLS also provides three buses and several input and output jacks for module interconnection and usability.
E	
EFS	See Error-Free Second.
EIA	Electronic Industries Association, see RS-XX specifications under the alphabetical listing in this glossary.
ELB	See Equipment Loopback.
Electronic Programmable Read-only Memory	An EPROM is a non-volatile memory chip which can be erased by exposing the chip to ultraviolet light. It may then be reprogrammed.
EPROM	See Electronic Programmable Read-only Memory.
Equipment	Any type of equipment that is connected to the node controller, TAC, TIU, or DIU.
Equipment Loopback	An ELB is a loop which sends the signal from the equipment back to the equipment. When the ELB is in affect, the equipment signal is not sent out to the line and does not pass through the CSU circuitry.
Equipment Low Density Second	A second during which pulse stuffing or a keep-alive signal was applied to the network.
EQP	See Equipment.
EQPT	See Equipment.
Errored Second	A second with one or more ESF error events.

Term	Definition
Error-Free Second	A second with no detected errors.
Errored Seconds - Line	The number of seconds with one or more Code Violation-Lines. See *CV-L*.
Errored Seconds-Path	The number of seconds that a bipolar violation occurs on the DS-1 (T1) line. See *CV-P*.
ES	See Errored Seconds.
ES-L	See Errored Seconds-Line.
ES-P	See Errored Seconds-Path.
ESF	See Extended Superframe Format.
ESF Facility Data Link	The ESF Facility Data Link is used in ESF circuits to transmit framing (performance report messages PRMs), error events, and loopback controls. The ESF Facility Data Link uses 4 kbps of bandwidth to transmit data.
ESF Error Event	An event that occurs when an ESF contains either a CRC-6 error event or an Out of Frame event.
Event Log	Each time a system event occurs (such as a system start-up, shut-down, log in, log off, start or finish of polling, etc.), a record is made and saved ("logged") to database in Access Manager 2000. These events can then be viewed at a later time.
Extended Superframe Format	Extended Superframe Format: an AT&T imposed T1 framing standard that provides a frame synchronization, cyclic redundancy check, and checking data and link bits. This standard allows errors to be stored and retrieved easily, enhancing network maintenance. The Extended Super-frame framing format divides a 1.544 Mbps (DS-1) line into four main sections and contains 24 frames: (1) Traffic and signalling [1.536 Mbps] --- Divided into 24 64-kbps channels in one frame. (2) Framing [2 kbps] (3) CRC-6 [2 kbps] --- See ESF Error Event (4) Facility Data Link [4 kbps] --- See ESF Facility Data Link

Term	Definition
F	
Failed Second	See *Unavailable Seconds (UAS).*
Failed Signal State	A failed signal state is declared whenever 10 SESs occur consecutively. (The FSS will not clear until 10 consecutive seconds of data are processed with no SESs present). New standards refer to a failed signal state as an *Unavailable Signal State* (UASS).
Far-En	This refers to a circuit element located at the remote end of a T1 circuit, which may be accessed through the ESF Data Link to control and retrieve performance data.
FCC	Federal Communications Commission: a board of commissioners appointed by the President under the Commissions Act of 1934, with the authority to regulate all interstate telecommunications originating in the United States.
FDL	See ESF Facilities Data Link.
FE	See Frame Bit Error.
FEC	See Forward Error Correction.
Forward Error Correction	A technique used by a receiver for correcting errors incurred in transmission over a communications channel without requiring the retransmission of the information by the transmitter.
Frame Bit Error	An error in the received framing bit pattern.
Frame Bit Errored Second	The number of whole seconds that a framing bit error has occurred.
Front-end Processor	A special purpose computer dedicated to the handling of communication links for a host computer.
FS	Failed Second. See Unavailable Seconds (UAS).
FSS	See Failed Signal State.
Full Duplex	A communication link where both pieces of equipment can transmit in both directions at the same time.

Term	Definition
G, H	
Hub Office	A central location from which an operator can access an Access System 2000 node for administration and/or testing. The Access Manager 2000 controller is normally located at the hub office for dial-up interface with systems at one or more distant customer premises.
Hz	Hertz: A unit of frequency equal to one cycle per second.
I, J,	
Idle Code	The code that is transmitted when no user data is present on the net. The Idle Code may be configured for ALL-ONES or Flags [01111110].
In-band	Within the same frequency band.
Jitter	The slight movement of a transmission signal which can introduce errors and loss of synchronization in high speed synchronous transmission links.
kbps	See Kilobits Per Second.
Kilobits per Second	A measure of data transfer equaling one thousand binary digits transmitted or received through a medium every (one) second.
L	
LAN	See Local Area Network.
LBO	See Line Build-Out
LED	See Light Emitting Diode.
Light Emitting Diode	A light-emitting diode is a device which will light up when the proper current is passed through it. It is used on Verilink modules for identifying loops, errors, and other current conditions of T1 lines.
Line Build-Out	Line Build-Out is the attenuation signal strength used by the CSU to the network interface and is determined byh the distance from the CSU to the first line repeater.

Term	Definition
Line Loopback	An LLB is a loop which takes the signal from the DS-1 network and loops it back toward the network. The loop does not allow the DS-1 signal to pass through the CSU (except for critical protection circuitry and the repeater), making it useful for testing the DS-1 line.
LLB	See Line Loopback.
Local Area Network	A type of high-speed data communications connection where all segments of the transmission medium are in the office.
LOF	See Loss-of-Frame.
LOFS	See Loss-of-Frame Second.
Login	To log in to a computer is to establish a connection through an input device to identify yourself as an authorized user.
Loopback	A method of checking the accuracy of a data transmission in which the transmitted data is looped back to its source for comparison. Loopbacks may be initiated from various point along the circuit.
LOS	See Loss-of-Signal.
Loss-of-Frame	Loss-of-Frame alarm is declared when a 3-second interval of continuous Out-Of-Frame (OOF) or Loss-Of-Signal (LOS) state is detected. An LOF alarm is cleared when at least 10 seconds of continuous non-LOS or non-LOF condition exists.
Loss-of-Frame Count	An accumulation of the number of times a Loss-Of-Frame alarm is declared.
Loss-of-Frame Second	LOFS is the total number of seconds that the CSU was in the LOS state.
Loss-of-Signal	The state of a T1 line when no bits are detected on input to the receiving equipment. The time for detection of loss of signal will vary depending on the type of equipment used. The Loss-Of-Signal state is then integrated into a LOS alarm after 3 seconds of continuous Loss-Of-Signal state.
Loss-of-Signal Second	A second during which the CSU is in a Loss of Signal state. These seconds are recorded by the NCCs and TACs in Access System 2000 nodes.

Term	Definition
M	
Master NCC 2020	This module provides the operator interface between an Access Manager 2000 controller, ASCII terminal, or NCC front panel thumbwheel switch and an NCC, TAC, or DIU in an Access System 2000 node. When multiple nodes are present, each node has one master NCC which is linked through a RS-232D daisy chain to all other master NCCs for Access Manager 2000 operator interface over a single line. The Master NCC occupies the first slot of Shelf 1 in each system node.
Mbps	See Megabits per second.
Megabits per Second	A measure of data transfer equaling one million binary digits transmitted or received through a medium every (one) second.
Megahertz	Megahertz means “million hertz” or “million cycles per second.”
MHz	See Megahertz.
MLS	See Multiline Shelf.
Modem	Modulator / Demodulator; an electronic device that enables digital data to be sent across the network.
Multiline Shelf	A multiline shelf (MLS) is a component of the Access System 2000 which is used to house 13 (or less) plug-in modules such as NCCs, TACs, TIUs, and DIUs. The MLS also provides three buses and several input and output jacks for module interconnection and usability. The MLS 2200 shelf provide the same module capacity, as well as, providing 7 Data Buses.
Multiplex	A combination of information channels onto a single transmission bearer.
Multiplexer	A multiplexer takes several lower speed lines (channels) and combines them into one faster line (channel).
Mux	See Multiplexer.

Term	Definition
N	
NCC	See Node Controller.
Near-En	This refers to a circuit element that is accessed locally by Access Manager (i.e., does not require the ESF data link.).
Network	The DS-1 (T1) transmission medium provided by a telephone company or other provider for use by customers. This can be twisted-pair cables and line repeaters, a higher level digital multiplexer, fiber optic system, or other carrier facility.
Network Interface	The equipment that provides the NCC connection to the network. The NI is normally equipped with a jack, connector, or punch-down block.
NI	See Network Interface.
NMS	Network Management System (e.g., Access Manager 2000).
Node	A location where one or more pieces of equipment interconnect transmission lines (ISO). A physical device that allows transmission of data onto a network (e.g., Access System 2000).
Node Access Type	The particular type of connection between Access Manager and the node being addressed.
Node Controller	The circuit in the NCC that performs operator control and interface operations.
Node Controller and Channel Service Unit (NCC)	An AS2000 circuit element providing both node controller and channel service unit functionality. The node controller provides ASCII craft interface and thumbwheel interface, for local management and RE-232 interface for Access Manager 2000 management.

Term	Definition
O, P	
On-line	On-line is a selection of Access Manager 2000 available from the Main Menu. Under On-line are operations that access the contents of a circuit element's performance registers and any trouble conditions which the circuit element may be detecting. Under the On-line menu, circuit elements may be commanded to run diagnostic tests and set loopbacks. The current configuration of network elements is accessible from the On-line menu of Access Manager 2000.
OOF	See Out-of-Frame.
Out-of-Frame	A condition when any two of four or two of five consecutive frame bits received from the T1 line are incorrect. This causes the CSU to attempt to reframe.
Out-of-Frame Second	A second during which an Out-of-Frame condition exists.
Parity	A technique used to help detect data transmission errors. A non-information bit is added to a byte.
Parts per Million	This refers to the number of unique units present in a group of one million units.
Payload Loopback	This loopback loops the signal from the DS-1 (T1) line back to the DS-1 line intact. The signal passes through the CSU when using PLB, including the repeater, making it useful for testing the CSU from the far-end circuit.
Performance Data	Information generated and stored by the CSU of an NCC or TAC that indicates the transition quality of a signal received from the DS-1 (T1) equipment or network. This information includes data such as ESF error events, errored seconds, etc. The performance data is stored in numerous registers for operator retrieval.
Phase	The time or angle that a data signal is delayed with respect to a reference point(s).
PLB	See Payload Loopback.
ppm	See Parts per Million.

Term	Definition
Point-to-point	A term used to describe a circuit that interconnects two points directly.
Port	The point of access into a computer network or other electronic device.
Power Supply (PAC/PDC)	A power supply is the device which converts AC to DC or DC to a different DC voltage for use by the NCCs, TACs, DIUs, etc.
Privileged Password	A password that allows an ACSII terminal operator to perform network management functions on a Access System 2000 module.

Q, R

QRSS	See Quasi-Random Signal Sequence.
Quasi-Random Signal Sequence	One of four test patterns sent from the CSU. It is used to diagnose problems with either equipment or the telco DS-1 line.
RAI	See Remote Alarm Indication.
RAM	See Random Access Memory.
Random Access Memory	A memory device whereby any location in memory can be written to or retrieved from with the same average speed. RAM is usually measured in kilobytes.
Read-Only Memory	A memory device which can only be read.
Remote Alarm Indication	See Yellow Alarm.
Remote Alarm Indication Seconds	The number of seconds during which a CSU is in Yellow Alarm. The RAIS counts are stored by the NCCs and CSUs in Access System 2000 nodes.
Register	A circuit in a CSU that stores a T1 circuit performance data parameters for retrieval by an ASCII terminal operator or AM2000. Each register can be reset by an authorized operator after data retrieval.

Term	Definition
Repeater Loopback	The repeater loopback connects the CSU network output signal back toward the equipment. It loops the whole CSU (except the CSU network input and output transformers) toward the equipment. This loopback has an automatic time-out that releases the loopback after a pre-selected time. This loopback is helpful in testing the NET-side repeater and the network-side critical circuitry in the loopback.
RLB	Repeater Loopback.
ROM	See Read-Only Memory.
Route	A route consists of the two network circuit elements at T1 circuit end-points as accessed by Access Manager. For these programs, a circuit and a route are functionally equivalent.
RS-232	A common interface standard that permits DTEs and DCEs to successfully interconnect.
RTS	Request To Send.
S	
SEFS	See Severely Errored Framing Second.
Severely Errored Framing Second	Those seconds in which two or more framing bit errors occur within a 3-millisecond period. For ESF, this interval may or may not coincide with an ESF (i.e, six framing bits).
SF	See Superframe.
Stop-bit	In asynchronous transmission, the last transmitted element in each character, which informs the receiver to become idle before accepting another character.
Subchannel	A subchannel is any segment of a DS-0 channel that is used to complete a circuit without effecting other traffic within the DS-0.
Subrate	In the reference the transmission speeds falling between 300 bps and 9.6 kbps.

Term	Definition
Superframe	The superframe framing format divides a 1.544 Mbps DS-1 (T1) line into two major sections and contains 24 frames: (1) Traffic and signalling [1.536 Mbps] --- Divided into 24 DS0 (64 kbps) channels in one frame. (2) Framing [8 kbps] SF is the predecessor of ESF and still is used when ESF in not available.
Synchronous	A method of transmission where an uninterrupted block of data is sent. Each block is preceded by one or more sync characters to synchronize the receiver with the datastream.
System Node	All modules (NCC, TACs, DIUs, TIUs) controlled by a master node controller (NCC) through the Access Manager or ASCII terminal operator interface. Each master NCC in a node performs these control functions. Each node can have up to 30 modules in any combination.
T	
T1	A 24 channel, 1.544 Mhz bit stream used for data transmission. T1 uses two twisted pair conductors to accomplish full duplex transmission.
TAC	T1 Aggregate and Channel Service Unit Module.
Telco	See Telephone Company.
Telephone Company	A company that provides its customers with a communications line whether digital or analog.
Telephone Company Register	A DS-1 performance data register from which either a Telco or customer operator can retrieve data, but only a telco operator can reset.
Terminal	A computer terminal is an input/output device whereby a user is able to communicate directly with a computer. A terminal must have a keyboard and a display
Twisted Pair	A pair of insulated conductors that are twisted around each other, mainly to reduce the effects of electrical noise. Twisted pair is typical of standard telephone T1 wiring.

Term	Definition
U	
UAS	See Unavailable Second.
UL	See Underwriters Laboratory
Unavailable Second	Counted for every second in which an Unavailable Signal State occurs. This term is used by new standards in place of *Failed Seconds* (FS).
Underwriters Laboratories	A company that tests equipment for electronic safety. If the instrument passes this company's tests, it is underwritten and given the "UL" seal.
Unavailable Signal State	An Unavailable Signal State is declared whenever 10 consecutive SESs occur. The Unavailable Signal State will not clear until 10 consecutive seconds of data are processed with no SESs present.
Unprivileged Password	An ASCII interface (CRAFT) password that permits an ASCII operator to perform limited operations on an Access System module.
U, V	
User	The operator of any device.
Volts Alternating Current (V_{ac})	An acronym used for labeling the number of volts on an alternating current. For example: 32 Vac = 32 volts on alternating current.
Volts Direct Current (V_{dc})	An acronym used for labeling the number of volts on a direct current. For example: 32 Vdc = 32 volts on direct current.
W, X, Y, Z	
Word Length	The number of bits or characters in a word, which is usually determined as a convenient size for processing storages or transmission. Word length is often based on the register size and internal operation of a computer.

Term	Definition
Yellow Alarm	A Yellow Alarm is the alarm a receiving channel bank or multiplexer sends to the other end of the circuit when it detects a loss of signal or loss of frame. There is a 2- to 3-second integration period upon detection of loss of signal or loss of frame before a yellow alarm is sent to the far-end equipment. This condition is also referred to as a *remote alarm* or *remote alarm indication*: In the Superframe format, a yellow alarm consists of Bit 2 of all 24 channels set to zero. In ESF format, the yellow alarm is a repeating pattern of eight ONEs followed by eight ZEROs transmitted over the ESF Data Link.
Yellow Alarm Transcoding	When a DS1 signal undergoes framing format conversion from SF (D4) to ESF, or ESF to SF, an existing yellow alarm must be transcoded to the new format so that the alarm can be detected by the network or DTE equipment. An integration time is used before transcoding occurs to allow for data that merely looks like yellow alarm (in the SF mode), and to allow for detection of a yellow alarm in the presence of errors. For SF, the detection and clear time is 400 +/- 1 millisecond. For ESF, this time is 63 to 66 milliseconds.
Zero Code Suppression	The insertion of a “one” bit to prevent the transmission of eight or more consecutive “zero” bits; used primarily with T1 and related digital circuits.

Appendix

B Modem Configuration

This appendix describes how to configure modems when used with CSUs or shelf controllers when operating in the Open Systems Interconnection (OSI) or Telemetry Asynchronous Block Serial (TABS) protocol.

OSI Protocol Configuration

This section describes the modem configuration options for the OSI feature of Access Manager.

Modem Configuration for OSI Protocol With DTR Lead

Table B-1, "Modem Configuration for OSI Protocol (DTR Lead)," on page B-3, lists the switch configurations for a Hayes Smartmodem ™ 1200. This table also lists the AT commands for a Hayes Smartmodem™ 2400 when used to connect a PC running Access Manager 2000 to a CSU or Controller equipped with a DTR lead. For further instruction, see the Hayes SmartModem™ 2400 user manual for configuration information.

Modem Configuration for OSI Protocol Without DTR Lead

Table B-2, "Modem Configuration for OSI Protocol without DTR Lead," on pag eB-4 lists the switch configurations for a Hayes Smartmodem ™ 1200 and the ATcommands for a Hayes Smartmodem ™ 2400 when used to connect a PC running Access Manager to a CSU or Controller without a DTR lead. For further information, see the Hayes Smartmodem ™ 2400 user manual in the configuration section.

Hayes Smartmodem™ 2400 Configuration

If a Hayes Smartmodem ™ 2400 is to be used with a CSU or Controller, it must be configured before connecting it to the CSU or Controller. This is performed by connecting it to:

- An ASCII terminal
- APC equipped with an ASCII terminal emulation program
- A communications program

The modem must be configured to communicate at 2400 baud, 8 data bits, no parity, one stop bit.

Modem Configuration Commands

All the commands listed in Table B-1, "Modem Configuration for OSI Protocol (DTR Lead)," on page B - 3 through Table B-3, "Modem Configuration for TABS Protocol," on page B-6 must be preceded by the characters AT. For example, to disable character echo, type "ATE0&W". Otherwise, the following command should also be entered to cause the modem to recall User Profile 0 on power-up:

```
AT&Y0&W
```

The "&W" command writes the changes to User Profile 0. See the following tables:

- Table B-1, "Modem Configuration for OSI Protocol (DTR Lead)," on page B-3
- Table B-3, "Modem Configuration for TABS Protocol," on page B-6

Be careful if you enter commands after you have completed the Smartmodem configuration. Any subsequent commands at a different baud rate may override the 2400 baud speed selection. The last command entered and stored with "&W" determines the speed at which the Smartmodem initially answers an incoming call.

Note: *This configuration does not apply to CSUs and Controllers in the OSI Mode. It is for use only with non-OSI Protocol CSUs or Controllers.*

Modem Initialization by CSU or Controller

To properly initialize the modem after it is configured, powered up, and connected to the CSU or Controller, the CSU or Controller should be powered down for a few seconds and then powered up again. This will allow the CSU or Controller to initialize the modem and configure itself

OSI Compatible Equipment

The following devices operate with the configuration shown in Table B - 1, "Modem Configuration for OSI Protocol (DTR Lead)," on page B - 3.

- NC/E

- SIM
- Current 551VST ML List 2 with List 2 MLB shelf or upgraded List 1 shelf and NMC List 2 Controller
- Current 551VST List 2
- Access System 2000
- ConnecT1 Plus
- 551VST List 2 (without DTR lead), hardware revision 0.0 as displayed by Access Manager
- 551VST ML List 2 Controller with List 1 shelf (without DTR lead)

Table B-1 Modem Configuration for OSI Protocol (DTR Lead)

Parameter	Smartmodem™ 1200 Switch Position	Option	Smartmodem 2400 AT Command
DTR status not ignored	SW1 up	Follows DTR. Hangs up and goes to command state if signal drops	&D2&W
Result code format	SW2 down	Numbers	V0&W
Result code display	SW3 down	Codes are displayed	Q0&W
Character echo	SW4 down	Characters not echoed in command state	E0&W
Auto-answer	SW5 down	Disabled	S0=0&W
Carrier detect and data set ready	SW6 up	Reflects actual result of attempt to connect	&C1&S1&W
TELCO jack type (Note 2)	SW7 up	RJ-11, RJ-41S, RJ-45S	&J0&W
	SW7 down	RJ-12, RJ-13	&J1&W
Command recognition	SW8 down	Enabled	Internal jumper set to Command Recognition
Communication standard at 1200 bps	SW9 up	Bell 212A	B1&W
Response to DTR transition (when SW1 is up)	SW10 u	Hangs up and goes to command state	Set by SW1 option

Parameter	Smartmodem™ 1200 Switch Position	Option	Smartmodem 2400 AT Command
NOTE 1. Factory position indicated by boldface. NOTE 2. Position of SW7 depends on the type of phone jack used. Most installations use an RJ11 jack (SW7 up).			

Table B-2 Modem Configuration for OSI Protocol without DTR Lead

Parameter	Smartmodem™ 1200 Switch Position	Option	Smartmodem 2400 AT Command
DTR status ignored	SW1 down	Ignores DTR state if signal drops	&D0&W
Result code format	SW2 down	Numbers	V0&W
Result code display	SW3 down	Codes are displayed	Q0&W
Character echo	SW4 down	Characters not echoed in command state	E0&W
Auto-answer	SW5 down	Disabled	S0=0&W
Carrier detect and data set read	SW6 up	Reflects actual result of attempt to connect	&C1&S1&W
TELCO jack type (Note 2)	SW7 up	RJ-11, RJ-41S, RJ-45S	&J0&W
	SW7 down	RJ-12, RJ-13	&J1&W
Command recognition	SW8 down	Enabled	Internal jumper set to Command Recognition
Communications standard at 1200 bps	SW9 up	Bell 212A	B1&W
Response to DTR transition (when SW1 is up)	SW10 up	Hangs up and goes to command state	Set by SW1 option
NOTE 1. Factory position indicated by boldface. NOTE 2. Position of SW7 depends on the type of phone jack used. Most installations use an RJ-11 jack (SW7 up).			

TABS Protocol Configuration

The switch configurations for a Hayes Smartmodem ™ 1200 or 2400 connected to a CSU or Controller operating in the TABS mode are detailed inTabl eB-3, "Modem Configuration forTABS Protocol," on page B-6. The modem at the Access Manager end should be configured per Table B-1, "Modem Configuration for OSI Protocol (DTR Lead)," on page B-3. For further information, see the user manual for the modem. Note that the CSU or Controller is limited to 1200 baud when configured for TABS.

The following CSUs and Controllers will only work in the TABS mode:

- 551VST List 1, 1/A, 1/ B
- 551VST ML List 1 Controller
- 551VST List 2 in TABS mode (installed in Access Manager as a 551VST 1/B)

CAUTION

The 551VST List 2 CSU should always be configured to perform automatic configuration during power-up. Otherwise, a service interruption may occur.

Table B-3 Modem Configuration for TABS Protocol

Parameter	Smartmodem™ 1200 Switch Position	Option	Smartmodem 2400 AT Command
DTR status ignored	SW1 down	Ignores DTR	&D0&W
Result code format	SW2 down	Number	V0&W
Result code display	SW3 up	Codes are not displayed	Q1&W
Character echo	SW4 down	Characters not echoed in command state	E0&W
Auto-answer	SW5 up	Enabled	S0=1&W
Carrier detect	SW6 up	Reflects actual result of attempt to connect	&C1&S1&W
TELCO jack type (Note 2	SW7 up	RJ-11, RJ-41S, RJ-45S	&J0&W
	SW7 down	RJ-12, RJ-13	&J1&W
Command recognition	SW8 up	Disabled	Internal jumper set to disable command recognition (Note 3)
Communication standard at 1200 bps	SW9 up	Bell 212A	B1&W
Response to DTR transition (when SW1 is up)	SW10 up	Hangs up and goes to command state	Set by SW1 option

NOTE 1. Factory position indicated by boldface.

NOTE 2. Position of SW7 depends on the type of phone jack used. Most installations use an RJ-11 jack (SW7 up).

NOTE 3. The internal jumper should be set to enable command recognition to configure the other options in the table. After the configuration is complete, power down the modem and set the internal jumper to disable command recognition.

Appendix

C

Alarm Report Record Format

Alarm Record Layout

The alarm processing logic in Access Manager 2000 allows you to send the alarm notification to a user-specified alarm channel. This alarm channel can be a serial port, printer port, or file.

You can specify alarm notification to be sent in plain English text (verbose), terse format (ASCII-encoded binary), or Accumaster Alarm format. The terse version is designed to be processed by other computing equipment, with all status changes for a circuit element packed into one notification message for alarm-activated status and another notification message for alarm-cleared status. The plain-English version sends one notification for each status change. It is designed to be used with a printer and to be written to a disk file. The Accumaster format is used to send alarms to the Accumaster Integrator system.

Plain English Alarm Notification

Access Manager prints one alarm notification for each alarm condition. The notification has the following general format:

```
mm/dd/yy hh:mm:ss <alarm description> at
<circuit element>
```

Terse Alarm Notification

The layout of the terse alarm notifications is given in Table C-1, “Terse Alarm Message Layout,” on page C - 2.

Node types 551VST List 1/A, 551VST List 1/B**,** and 551VST ML List 1 do not generate alarm records. Do not use the terse alarm format for output to printers.

The Status Code Tables

The following tables contain status codes:

- Table C-2, “551VST List 2 Status Codes,” on pag eC-4 lists the 551VST List 2 status codes.
- Table C-3, “NC/E Status Codes,” on page C - 4 lists the NC/E status codes.
- Table C-4, “SIM Status Codes,” on pa geC-5 lists the SIM status codes.
- Table C-5, “NMC List 2 Status Codes,” on page C - 6 lists the NMC List 2 status codes.
- Table C-6, “AS2000 Near-End Network Status Codes,” on page C-6 lists the AS2000 near-end network status codes.
- Table C-7, “AS2000 Near-End Equipment Status Codes,” on page C-8 lists the AS2000 near-end equipment status codes.
- Table C-8, “AS2000 Far-End Network Status Codes,” on page C - 8 lists the AS2000 far-end network status codes.
- Table C-9, “AS2000 Far-End Equipment Status Codes,” on page 9 lists AS2000 far-end equipment status codes.
- Table C-10, “Additional NCC 2020 Status Codes,” on pag eC-10 lists additional status codes.

The master CSU of each Access System 2000 reports separate status codes for the near-end and corresponding far-end NCC 2020s, and TAC 2010s in that node.

Accumaster Status Code Format

Contact AT&T for information on the Accumaster Integrated Alarm Interface Specification. This information is proprietaryto AT&T.

Table C-1 Terse Alarm Message Layout

Field	Byte	Length	Description
1	0	1	SOH (0 x 01)
2	1 - 2	2	Year of the alarm timestamp

Field	Byte	Length	Description
3	3 - 4	2	Month of the alarm timestamp
4	5 - 6	2	Day of the alarm timestamp
5	7 - 8	2	Hour of the alarm timestamp
6	9 - 10	2	Minute of the alarm timestamp
7	11 - 12	2	Second of the alarm timestamp
8	13 - 32	20	Name of the node
9	33 - 37	5	Node I
10	38 - 40	3	Node (or Circuit Element) type 26 = 551VST List 2 33 = NC/E 32 = SI 24 = 551VST ML List 2 (NMC List 2) 48 = NC 49 =TAC 56 = ConnecT1 Plus 58 = CC
11	41 - 42	2	Shelf number - A value of 00 indicates the alarm is for the Controlle (NCC/CCC) itself rather than for a specific shelf.
12	43 - 44	2	Plug-in number - A value of 00 indicates that alarm is for the shelf specified by shelf number. Otherwise, the alarm is for a specific plug-in.
NOTE: If you are using AS2000 or ConnecT1 Plus equipment, use Field 13 for byte 45. Otherwise, use Fields 13A and 13B.			
13	45	3	These bytes are used as status codes for identifying changes-in-condition of Access System equipment.
13A	45	1	Set or clear flag 1 = status changes reported are set conditions. 0 = status changes reported are cleared conditions.
13B	46 - n	-	Status codes changed - Each code is represented by two ASCII characters. Since these codes are not unique among various devices, the node type must be used in conjunction with the code to identify the alarm type. The status codes for the various equipments are listed in Tab leC-2, “551VST List 2 Status Codes,” on pa geC-4 through Ta bleC-5, “NMC List 2 Status Codes,” on p ageC-6.
14	n + 1	1	Terminator

Field	Byte	Length	Description
15	n + 2	1	Byte n+2 is a One-byte checksum. This checksum is 2's complement of the sum of all bytes in the alarm record (modulo 256), excluding the SOH (Field 1) and terminator (Field 14) bytes.

Table C-2 551VST List 2 Status Code

Status Code (hex)	Description
00	Near BER exceeded
01	Near SPAN LOS alarm
02	Near EQPT low density
03	Near LLB or PLB looped
04	Near ELB or RLB looped
08	Far BER exceeded
09	Far SPAN LOS alarm
0A	Far EQPT low density alar
0B	Far LLB or PLB looped
0C	Far ELB or RLB loope
0F	Far CSU absent alarm

Table C-3 NC/E Status Codes

Status Code (hex)	Description
00	Near BER exceeded
01	Near SPAN LOS alarm
02	Near EQPT low density alarm
03	Near LLB or PLB looped
04	Near ELB or RLB looped
06	Near fuse blown
07	Near CSU absent alarm
08	Far BER exceeded
09	Far SPAN LOS alarm
0A	Far EQPT low density alar
0B	Far LLB or PLB looped
0C	Far ELB or RLB loope
0F	Far CSU absent alarm

Status Code (hex)	Description
12	Power fuse blown
15	SIM absent
20	NC/E powered up

Table C-4 SIM Status Codes

Status Code (hex)	Description
00	Near BER exceeded
01	Near SPAN LOS alarm
02	Near EQPT low density alarm
03	Near LLB or PLB looped
04	Near ELB or RLB looped
06	Near fuse blown
07	Near CSU absent alarm
08	Far BER exceeded
09	Far SPAN LOS alarm
0A	Far EQPT low density alar
0B	Far LLB or PLB looped
0C	Far ELB or RLB loope
0F	Far CSU absent alarm
12	Power fuse blown
21	SIM powered up

Table C-5 NMC List 2 Status Codes

Status Code (hex)	Description
00	Near BER exceeded
01	Near SPAN LOS alarm
02	Near EQPT low density alarm
03	Near LLB or PLB looped
04	Near ELB or RLB looped
06	Near fuse blown
07	Near CSU absent alarm
08	Far BER exceeded
09	Far SPAN LOS alarm
0A	Far EQPT low density alar
0B	Far LLB or PLB looped
0C	Far ELB or RLB loope
0F	Far CSU absent alarm
11	Power Fuse A failure
12	Power Fuse B failure
13	Power Fuse C failure
14	Power Fuse D failure
20	NMC List 2 powered up

Table C-6 AS2000 Near-End Network Status Codes

Status Code (hex)	Decimal Equivalent	Description
65	101	Near NET BER exceeded
66	102	Near NET BER exceeded cleared
67	103	Near NET ES-L exceeded
68	104	Near NET ES-L exceeded cleared
69	105	Near NET ES exceeded
6A	106	Near NET ES exceeded cleared
6B	107	Near NET UAS exceeded
6C	108	Near NET UAS exceeded cleared
6D	109	Near NET LLB looped
6E	110	Near NET LLB looped cleared
6F	111	Near NET PLB looped

Status Code (hex)	Decimal Equivalent	Description
70	112	Near NET PLB looped cleared
71	113	Near NET LOS alarm
72	114	Near NET LOS alarm cleared
73	115	Near NET RAI alarm
74	116	Near NET RAI alarm cleared
75	117	Near NET LOF alarm
76	118	Near NET LOF alarm cleared
77	119	Near NET AIS alarm
78	120	Near NET AIS alarm cleared
79	121	Near NETTest SIG alarm
7A	122	Near NETTest SIG alarm cleared
7B	123	Near CSU loss of external clock alarm
7C	124	Near CSU loss of external clock alarm cleared

Table C-7 AS2000 Near-End Equipment Status Codes

Status Codes (hex)	Decimal Equivalent	Description
C9	201	Near EQPT BER exceeded
CA	202	Near EQPT BER exceeded cleared
CB	203	Near EQPT ES-L exceeded
CC	204	Near EQPT ES-L exceeded cleared
CD	205	Near EQPT ES exceede
CE	206	Near EQPT ES exceeded cleare
CF	207	Near EQPT UAS exceeded
D0	208	Near EQPT UAS exceeded cleared
D1	209	Near EQPT ELB looped
D2	210	Near EQPT ELB looped cleared
D3	211	Near EQPT RLB looped
D4	212	Near EQPT RLB looped cleared
D5	213	Near EQPT LOS alarm
D6	214	Near EQPT LOS alarm cleared
D7	215	Near EQPT RAI alarm
D8	216	Near EQPT RAI alarm cleared
D9	217	Near EQPT LOF alarm
DA	218	Near EQPT LOF alarm cleared
DB	219	Near EQPT AIS alarm
DC	220	Near EQPT AIS alarm cleared
DD	221	Near EQPTTest SIG alarm
DE	222	Near EQPTTest SIG alarm cleared
DF	223	Near EQPT low density alarm
E0	224	Near EQPT low density alarm cleared

Table C-8 AS2000 Far-End Network Status Codes

Status Codes (hex)	Decimal Equivalent	Description
12D	301	Far NET BER exceede
12E	302	Far NET BER exceeded cleared
12F	303	Far NET ES-L alarm
130	304	Far NET ES-L alarm cleared
131	305	Far NET ES alarm
132	306	Far NET ES alarm cleared

Status Codes (hex)	Decimal Equivalent	Description
133	307	Far NET UAS alarm
134	308	Far NET UAS alarm cleared
135	309	Far NET LLB loope
136	310	Far NET LLB loop cleared
137	311	Far NET PLB looped
139	312	Far NET PLB loop cleared
139	313	Far NET LOS alarm
13A	314	Far NET LOS alarm cleared
13B	315	Far NET RAI alarm
13C	316	Far NET RAO alarm cleared
13D	317	Far NET LOF alarm
13E	318	Far NET LOF alarm cleared
13F	319	Far NET AIS alarm
140	320	Far NET AIS alarm cleared
141	321	Far NET Test SIG applied alarm
142	322	Far NET Test SIG alarm cleared
143	323	Far CSU loss of external clock alarm
144	324	Far CSU loss of external clock alarm cleared

Table C-9 AS2000 Far-End Equipment Status Codes

Status Codes (hex)	Decimal Equivalent	Description
191	401	Far EQPT BER exceeded
192	402	Far EQPT BER exceeded cleared
193	403	Far EQPT ES-L exceeded
194	404	Far EQPT ES-L exceeded cleared
195	405	Far EQPT ES exceeded
196	406	Far EQPT ES exceeded cleared
197	407	Far EQPT UAS exceeded
198	408	Far EQPT UAS exceeded cleared
199	409	Far EQPT ELB looped
19A	410	Far EQPT ELB looped cleared
19B	411	Far EQPT RLB looped
19C	412	Far EQPT RLB looped cleared

Status Codes (hex)	Decimal Equivalent	Description
19D	413	Far EQPT LOS alarm
19E	414	Far EQPT LOS alarm cleare
19F	415	Far EQPT RAI alarm
1A1	416	Far EQPT RAI alarm cleared
1A2	417	Far EQPT LOF alarm
1A3	418	Far EQPT LOF alarm cleared
1A4	419	Far EQPT AIS alarm
1A5	420	Far EQPT AIS alarm cleared
1A6	421	Far EQPT Test SIG alarm
1A7	422	Far EQPT Test SIG cleared
1A8	423	Far EQPT low density alarm
1A9	424	Far EQPT low density alarm cleare

Table C-10 Additional NCC 2020 Status Code

Status Codes (hex)	Decimal Equivalent	Description
1	001	Near CSU Power Up
3	003	Far CSU Power Up
1F5	501	Near New Plug
1F7	503	Near Plug Absent alarm
1F9	505	Near Plug Present
259	601	Dual Clocks Present alarm
25A	602	Dual Clocks Present alarm cleared
25B	603	No Clocks Present alarm
25C	604	No Clocks Present alarm cleared
3E9	1001	Alarm Buffer Full
3EA	1002	Near A Power Supply alarm
3EB	1003	Near A Power Supply alarm cleared
3EC	1004	Far A Power Supply alarm
3ED	1005	Far A Power Supply alarm cleared
3EE	1006	Near B Power Supply alarm
3EF	1007	Near B Power Supply alarm cleared
3F0	1008	Far B Power Supply alarm
3F1	1009	Far B Power Supply alarm cleared

Status Codes (hex)	Decimal Equivalent	Description
3F2	1010	Power-Up Loop Exists alarm
3F3	1011	Power-Up Self Test to NET Failure alarm
3F4	1012	Power-Up Self Test to EQPT Failure alarm
3F5	1013	Near CSU Power Up
321	801	Port 1 Loss of Signal alarm
322	802	Port 1 Loss of Signal alarm cleared
323	803	Port 2 Loss of Signal alarm
324	804	Port 2 Loss of Signal alarm cleared

Appendix

D

Installing Serial Ports

This appendix describes the settings and procedures used to add a standard serial board or a DigiBoard multichannel board in your personal computer (PC or PS/2). Access Manager can address more than the one or two standard serial ports as Comlines. DigiBoard DigiCHANNEL boards have been tested to work with the Access Manager running on IBM or 100% IBM-compatible personal computers (PC's). The three parts of this appendix describe the following:

- Standard PC and PS/2 serial port settings
- Installing multichannel boards in Micro Channel PS/2s
- Installing multichannel boards in PC-A

Standard PC or PS/2 Serial Port Settings

Before DigiBoard multichannel boards can be added to your PC, you should configure the serial ports supplied with the PC. Tables D-1 to D-3 list settings for the most common serial boards supplied with personal computers. For other serial port cards, refer to the associated hardware manual.

Table D-1 Standard Serial Ports for Micro Channel IBM PS/2

Comline Name (Caution)	Port Addr	IRQ	Shared I/O Addr	Status Mask
COM1	3F8H	4H	0H	0H

CAUTION

Using the PS/2 Reference Disk, install the built-in serial port a COM1. Installing it as any other port may cause the system to lock up.

Table D-2 Standard Serial Ports for IBM PC, XT, and AT

Comline Name (Note 1.)	Port Addr	IRQ	Shared I/O Addr	Status Mask
COM1	3F8H	4H	0H	0H
COM2	2F8H	3H	0H	0H
NOTE 1. Set the built-in serial port(s) as shown.				

CAUTION

To use the built-in serial ports with Access Manager, they must be installed and configured by the hardware switches. Installing the into the computer as any other port may cause the system to lock-up.

Table D-3 Serial Ports for Everex Magic I/O,AT Multi I/O, EV-170A, EV-170

Comline Name	Port Addr	IRQ	Shared I/O Addr	Status Mask
COM1 (Note 1)	3F8H	4H	0H	0H
COM2	2F8H	3H	0H	0H
COM3 (Note 2)	3E8H	2H	0H	0H
COM4 (Note 2)	2E8H	5H	0H	0H
NOTE 1. COM1 should be reserved for the built-in serial port equipped on many computers. NOTE 2. Only two COM ports are equipped on the EV-170A.				

Installing a DigiCHANNEL MC/4 or MC/8 and Editing a Comline

The DigiBoard DigiCHANNEL MC/4 and MC/8 boards are designed for use in IBM PS/2 Micro Channel personal computers. Each MC/8 board provides up to eight Comline ports. The MC/4 boards provide up to four Comline ports.

Installing the DigiCHANNEL MC/4 or MC/8 board is a four-part procedure:

1. Preparation
2. Hardware Installation
3. PS/2 Configuration
4. Configuring Access Manager.

Each part is relatively simple in itself, but you must perform all four procedures sequentially for your DigiCHANNEL MC/4 or MC/8 board to work.

Preparation

Copy the DigiBoard-supplied @6FE5.ADF and @6FE6.ADF files from your DigiWARE disk to your working copy of the Reference Diskette. This disk is used later by the System Configuration procedure. The ADF file contains the information that the system needs to automatically configure the DigiCHANNEL MC/4 or MC/8 board. The ADF file is in the subdirectory CONF on the DigiWARE disk that comes with the DigiCHANNEL board.

1. Make a working (backup) copy of your original IBM Reference Diskette, and store the original in a safe place. The backup disk must be a formatted high-density 1.44-megabyte 3.5-inch diskette. At this time, also make a copy of yourDigiWARE disk, and store the original in a safe place.

2. Copy the @6FE5.ADF and @6FE.ADF files from your DigiBoard DigiWARE disk to your working copy of the Reference Diskette. The ADF file contains the information that the system needs to know about the DigiCHANNEL MC/4 or MC/8 board.

CAUTION

It is imperative that the @6FE5.ADF and @6FE6.ADF files are copied to your configuration disk (Reference Diskette) BEFORE you install the DigiCHANNEL board. The self-configuring PS/2 system may not be able to boot up with the board in place and the ADF file missing. You can't go back and copy the file with a system that doesn't boot.

Hardware Installation

The second procedure, hardware installation, involves installing the DigiCHANNEL board in your system unit. Refer to your PS/2 hardware manual for this procedure.

PS/2 Configuration

When you have completed the hardware installation, you are ready to use the disk prepared in the preparation procedure and boot the system to run the IBM Automatic Configuration program. With the DigiCHANNEL MC/4 or MC/8 board installed in the system unit, you are now ready to configure the system to recognize the DigiCHANNEL board.

1. Insert the Reference Diskette into drive A:.
2. Boot the system with the Reference Diskette, containing the ADF file.
3. Follow the on-screen instructions to automatically reconfigure your system.
4. Type "Y" when the system tells you that it has found a board it doesn't recognize and asks you whether or not it should run Automatic Configuration.

   The @6FE5.ADF and @6FE6.ADF files contain information used by the automatic configuration program to select interrupts and addresses for interfacing with the DigiCHANNEL board. The default settings for the first DigiCHANNEL board are:

   - Board Interrupt 3
   - Start of Port Addresses DB80h
   - Status Port Address DBC0h

- COM2 Compatibility Disabled

The PS/2 auto configuration program automatically selects interrupts or addresses other than the ones listed above if it finds them already being used.

5. Review the settings selected to verify the board configuration before attempting to configure Access Manager. If a different starting address is desired, the start of port addresses should be changed at this time. Refer to Table D-4, “Serial Ports for DigiCHANNEL MC/4 or MC/8 in Micro Channel IBM PS/2,” on page D -6, Note 4, for a list of allowed starting addresses.

6. Press the <F10> key to save the changes.

7. Remove the Reference Diskette from drive A:.

8. Reboot your computer.

Configuring Access Manager to use the MC/4 o MC/8

To configure Access Manager, install the Comlines as described in *Chapter 4, Configuring Access Manager*. Ensure that your computer has been rebooted before you start configuring the Comlines.Tabl eD-4, “Serial Ports for DigiCHANNEL MC/4 or MC/8 in Micro Channel IBM PS/2,” on pag eD-6 lists the parameters used to define the ports of the DigiBoard MC/4 and MC/8.

The following list describes conditions for the table columns of Table D-4, “Serial Ports for DigiCHANNEL MC/4 or MC/8 in Micro Channel IBM PS/2,” on page D -6:

PORT #: DigiBoard DigiCHANNEL MC/4 boards use only Ports 1 through 4.

COMline Name: For an MC/8, eight consecutive Comlines must be reserved even if all ports are not used. The starting Comline can be from COM1 to COM9. For an MC/4, four consecutive Comlines must be reserved. The starting Comline can be from COM1 to COM13. If the built-in serial port is not used, you may start with COM1.

Port Address and Shared I/O Address: Use a different IRQ number for each DigiBoard, with the first board being IRQ 3. Use only the following IRQs for the second board: 4 or 5.

IRQ: The Shared I/O Status Port Mask always has the same value for the same port, number-independent of the port address range of the board.

Status Mask: The following range of starting and ending Port Addresses and Shared I/O Status Port Addresses may be used (each port address is 8h above the previous port on the board):

CAUTION

When adding Comline definitions, make sure you add them in consecutive ascending Comline Name order (COM1, COM2, COM3, etc.) and consecutive ascending port number (port 1, port 2, port 3, etc.).

If your computer has DigiCHANNEL MC/4 or MC/8 boards and if you add Comline definitions in any other order, Access Manager may lock up your computer. For example, this may happen if you do not install port 1 as COM3 and then install port 3 as COM2. IF ANY OF THESE CONDITIONS EXIST, YOUR COMPUTER MAY LOCK UP. The following list may assist you in troubleshooting this problem:

- Reboot your computer and restart Access Manager. The database recovery process should delete the incorrect record and allow you to log onto Access Manager.
- Copy the COMLINE.DAT and COMLINE.KEY files from the original database disk and restart Access Manager. If this does not clear the problem, contact Verilink Field Service for assistance. Current revisions of Access Manager have software to prevent the user from performing an incorrect installation for every other combination.

Table D-4 Serial Ports for DigiCHANNEL MC/4 or MC/8 in Micro Channel IBM PS/2

Port No.	Comline Nam	Port Addr)	IRQ	Shared I/O Addr	Status Mask
1	COM2	DB80H	3H	DBC0H	1H
2	COM3	DB88H	3H	DBC0H	2H
3	COM4	DB90H	3H	DBC0H	4H
4	COM5	DB98H	3H	DBC0H	8H

Port No.	Comline Nam	Port Addr)	IRQ	Shared I/O Addr	Status Mask
5	COM6	DBA0H	3H	DBC0H	10H
6	COM7	DBA8H	3H	DBC0H	20H
7	COM8	DBB0H	3H	DBC0H	40H
8	COM9	DBB8H	3H	DBC0H	80H

Port Address	RangeShared I/O Status Port Address
DB80H - DBBFH	DBC0H
DC00H - DC3FH	DC40H
BB80H* - BBBFH	BBC0H
BC00H - BC3FH	BC40H
AB80H - ABBFH	ABC0H
AC00H - AC3FH	AC40H
CB80H - CBBFH	CBC0H

NOTE 1. Two DigiBoard DigiCHANNEL MC/4 and MC/8 boards are presently usable with Access Manager. Refer to the appropriate hardware manual for port addresses, IQRs, shared I/O addresses, and status masks. When two (2) MC/8 are used, do not configure the built-in serial port in Access Manage .

NOTE 2. Page 26 of the DigiBoard manual incorrectly lists the start address as BB00H; the correct start address is BB80H.

CAUTION

Do not install software drivers provided by Digiboard for the MC/4 o MC/8. Since Access Manager has its own drivers for these boards using the Digiboard drivers will prevent Access Manager from working with the MC/4 or MC/8.

Installing a DigiCHANNEL PC/4, PC/8, or PC/16 and Editing A Comline

The DigiBoard DigiCHANNEL PC/4 and PC/8 boards are designed for use in IBM PC, XT, and AT personal computers and AT&T6386. The PC/16 provides up to 16 serial ports for Access Manager to configure as comlines. Each PC/8 board provides up to eight comlines, and each PC/4 board provides up to four comlines.

Installing the DigiCHANNEL PC/4, PC/8, or PC/16 board is a three-part procedure:

1. Configure the DigiCHANNEL board per the strapping option shown in the following tables:
   - For a PC/16 board use Table D-7, "Serial Ports for DigiCHANNEL PC/16 in IBM PC, XT, and AT," on page D-11.
   - For a PC/4 or PC/8 board use Table D-5, "Serial Ports for First DigiCHANNEL PC/4, PC/8 in IBM PC, XT, and AT," on page D-9
   - If a second PC/4 or PC/8 board is used, see Table D-6, "Serial Ports for Second DigiCHANNEL PC/8 in IBM PC, XT, and AT," on page D-10
2. Install the board(s) in your personal computer (PC). Refer to your computer manual for these instructions.
3. Configure Access Manager comlines to use the DigiCHANNEL boards, using the parameters in Tables E-5, E-6, and E-7.

Note: *Your Digiboard user's manual refers to the Shared I/O Address (Tables D-5, D-6 and D-7) as the Status Register Address. Also, the Port Address in these tables is referred to as the I/O Port Address.*

Table D-5 Serial Ports for First DigiCHANNEL PC/4, PC/8 in IBM PC, XT, and AT

Port No. (Note 2)	Comline Nam (Note 3)	Port Addr (Note 4)	IRQ (Notes 4&5)	Shared I/O Addr (Notes 4&5)	Status Mask
1	COM2	100H	3H	140H	0H
2	COM3	108H	3H	140H	1H
3	COM4	110H	3H	140H	2H
4	COM5	118H	3H	140H	3H
5	COM6	120H	3H	140H	4H
6	COM7	128H	3H	140H	5H
7	COM8	130H	3H	140H	6H
8	COM9	138H	3H	140H	7H

NOTE 1. The DigiBoard DigiCHANNEL PC/4 and PC/8 were formerly called DigiCHANNEL COM/4 and COM/8 respectively. If you are installing a second DigiCHANNEL PC /8 board, see TableD-6, "Serial Ports for Secon DigiCHANNEL PC/8 in IBM PC, XT, and AT," on pageD-10, for more Comline definitions. Refer to the appropriate hardware manual for other port addresses, IRQs Shared I/O addresses, and status masks.

NOTE 2. DigiBoard DigiCHANNEL PC/4 boards only use Ports 1 through 4.

NOTE 3. If your personal computer has a physical COMport before the Digiboards are added, see the following tables show the numbering sequence for data ports:

- Table D-5, "Serial Ports for First DigiCHANNEL PC/4, PC/8 in IBM PC, XT, andAT," on pageD-9
- Table D-6, "Serial Ports for Second DigiCHANNEL PC/8 in IBMPC,XT, and AT," on pageD-10.

In this case, the first port of the digiboard would be labeled COM 2.

If your computer has more than one physical COM port before installing the Digiboard, the number of the first Digiboard port would rise respectively.

REMEMBER: no matter how many physical COM ports your computer has, ALWAYS number the first DigiBoard port address at 100H

NOTE 4. The options shown are the factory default options. Use only IRQ 2, 3, 4, or 5 or your PC may not work with Access Manage . If IRQ 2 or 4 is used, the *Shared I/O Address* for this board should be 141H.

NOTE 5. If you plan on using your PC's built-in serial port as a Access Manager comline, first you must configure the comline to match the hardware switches for these ports. Configuring them in any other way may cause your system to lock-up.

CAUTION

Do not install software drivers provided by Digiboard for the PC/4 o PC/8. Since Access Manager has its own drivers for these boards using the Digiboard drivers will prevent Access Manager from working with the PC/4 or PC/8.

Table D-6 Serial Ports for Second DigiCHANNEL PC/8 in IBM PC, XT, andAT

Port No.	Comline Nam (Note 2)	Port Addr	IRQ (Note 3)	Shared I/O Addr (Note 3)	Status Mask
1	COM10	148H	5H	188H	0H
2	COM11	150H	5H	188H	1H
3	COM12	158H	5H	188H	2H
4	COM13	160H	5H	188H	3H
5	COM14	168H	5H	188H	4H
6	COM15	170H	5H	188H	5H
7	COM16	178H	5H	188H	6H
8	(See Note 2)	180H	5H	188H	7H

Port No.	Comline Nam (Note 2)	Port Addr	IRQ (Note 3)	Shared I/O Addr (Note 3)	Status Mask

NOTE 1. The DigiBoard DigiCHANNEL PC/8 was formerly called DigiCHANNEL COM/8. This table gives the Comline definitions if you install a second DigiCHANNEL PC/8 board. For the first 8 comline definitions, se Table D-5, “Serial Ports for First DigiCHANNEL PC/4, PC/8 in IBM PC, XT, andAT,” on pageD-9. Refer to the appropriate hardware manual for other port addresses, IRQs, Shared I/O addresses, and status masks.

NOTE 2. If your personal computer has a physical COMport before the Digiboards are added, see the following tables show the numbering sequence for data ports:
Table D-5, “Serial Ports for First DigiCHANNEL PC/4, PC/8 in IBM PC, XT, andAT,” on pageD-9

- Table D-5, “Serial Ports for First DigiCHANNEL PC/4, PC/8 in IBM PC, XT, andAT,” on pageD-9
- Table D-6, “Serial Ports for Second DigiCHANNEL PC/8 in IBMPC,XT, and AT,” on pageD-10.

In this case, the first port of the digiboard would be labeled COM 2.

If your computer has more than one physical COM port before installing the Digiboard, the number of the first Digiboard port would rise respectively. REMEMBER: no matter how many physical COM ports your computer has, ALWAYS number the first DigiBoard port address at 100H

NOTE 3. Use only IRQ 2, 3, 4, or 5 or your PC may not work with Access Manage . If IRQ 2 or 4 is used, the Shared I/O Address for this board should be 189H.

NOTE 4. Install multiple DigiCHANNEL PC/X boards without daisy-chaining. Therefore, you should use the IRQs shown in these tables and set both boards to Board Identification Number=0 (i.e. jumper J9, pin 2 to pin 3; an jumper J10, pin 2 to pin 3).

CAUTION

Do not install software drivers provided by Digiboard for the PC/4 o PC/8. Since Access Manager has its own drivers for these boards using the Digiboard drivers will prevent Access Manager from working with the PC/4 or PC/8.

Table D-7 Serial Ports for DigiCHANNEL PC/16 in IBM PC, XT, and AT

Port No.	Comline Nam (Note 1)	Port Addr (Note 2)	IRQ (Notes 2 & 3)	Shared I/O Addr (Notes 2&3)	Status Mask
1	COM2	100H	3H	140H	0H
2	COM3	108H	3H	140H	1H
3	COM4	110H	3H	140H	2H

Port No.	Comline Nam (Note 1)	Port Addr (Note 2)	IRQ (Notes 2 & 3)	Shared I/O Addr (Notes 2&3)	Status Mask
4	COM5	118H	3H	140H	3H
5	COM6	120H	3H	140H	4H
6	COM7	128H	3H	140H	5H
7	COM8	130H	3H	140H	6H
8	COM9	138H	3H	140H	7H
9	COM10	148H	3H	140H	8H
10	COM11	150H	3H	140H	9H
11	COM12	158H	3H	140H	AH
12	COM13	160H	3H	140H	BH
13	COM14	168H	3H	140H	CH
14	COM15	170H	3H	140H	DH
15	COM16	178H	3H	140H	EH
16	(See Note 1)	180H	3H	140H	FH

NOTE 1. Table D-7, “Serial Ports for DigiCHANNEL PC/16 in IBM PC, XT, and AT,” on pageD-11 assumes you computer is equipped with a built-in serial port at COM1. The DigiBoard ports should not include Comlines that are built into your PC and cannot be disabled; therefore, this table starts with COM2.

However, if your computer is not equipped with a built-in serial port, number the DigiBoard ports from COM1 through COM 16.The DigiBoard’s first COM port is always given Port A ddress=100H. All of the Digiboard’s other ports are addressed according to the tables in this appendix.

NOTE 2. The options shown are the factory default options. The Port Addresses are for Board 0 only and are not changeable. See the Digiboard manual for Board 1. The *Shared I/O* Address is not changeable.

NOTE 3. Use only IRQ 2, 3, 4, or 5 or your personal computer may not work with Access Manage . Whichever IRQ is used the *Shared* I/O Address for this board should be 140H.

CAUTION

Do not install software drivers provided by Digiboard for the PC/16 o PC/16. Since Access Manager has its own drivers for these boards, using the Digiboard drivers will prevent Access Manager from working with the PC/16 or PC/16.

Appendix

E

Archive File Formats

Event Log

The format of the *User Login Event* archive file uses the LOTUS 1-2-3 import format, in which each item is separated by a comma. From left to right, the data items on each line of the archive file are:

1. Event timestamp YEAR 2
2. Event timestamp MONTH 3
3. Event timestamp DAY 4
4. Event timestamp HOUR 5
5. Event timestamp MINUTE 6
6. Event timestamp SECOND 7
7. Event ID number
8. Event details (character format)

Event Log ID Number Codes

Access Manager keeps a record of all events occurring on the system in a database. When the database is archived, the title of these events are converted to a single integer. The following Event Log ID Number Codes table matches these integers to their respective events.

Table E-1 Event Log ID Number Codes

Event ID	Descripti
0	System start-up
1	System shut-down
2	User login
3	User logout
4	Polling node
5	End polling node
6	Node connection failed
7	Rescheduled polling
8	Get node ID failed
9	Get node status failure
10	Polling element
11	End polling element
12	Get ES data failure
13	Get UAS data failure
14	Get BES data failure
15	Get SES data failure
16	Get AIS data failure
17	Get LOS data failure
18	Get YEL data failure
20	Polling terminated by user
22	Get LOF data failure
23	Get ES-L data failure
24	Get SEFS data failure
25	Get OOFS data failure
26	Get Network OOFS failure
27	Get LOSS failure

Event ID	Descripti
28	Get AISS failure
29	Get BERS failure
30	Get Remote AISS failure
31	Get LOFS failure
32	Get DTE ES failure
33	Get DTE ES-L failure
34	Get DTE LC-V failure
35	Get DTE OOF failure
36	Get DTE Low Density Seconds failure
37	Get DTE BERS failure

Alarm Archive Record Layout Log

Access Manager stores the alarm records by archiving the alarm database. After being archived, the fields (which are changed into integers) in the alarm archive record are separated by commas. The record layout of the alarm archive record is as shown in the following tables:

- Table E-2, “Alarm Archive Record Layout for ESF CSUs,” on page E-4 and Table E -3, “Alarm Archive Record Layout for AS2000 and ConnecT1 Plus,” on pag eE-5
- Table E-4, “551VST List 2 Alarm Bit Definition,” on page E -6
- Table E-5, “NC/E Alarm Bit Definition,” on page E -7
- Table E-6, “NC/E Alarm Bit Definition 2,” on page E -7
- Table E-7, “NC/E Alarm Bit Definition 3,” on page E -8
- Table E-8, “SIM Alarm Bit Definition,” on page E -8.
- Table E-9, “NC/E Alarm Bit Definition 2,” on page E -9 This table lists the SIM alarm bits for the 4016 when the plug-in number is zero.
- Table E-10, “NMC List 2 Alarm Bit Definition 1,” on page E -9

- Table E-11, “NMC List 2 Alarm Bit Definition 2,” on page E -10. This table lists the NMC List 2 alarm bits for the 4016 L1 or L2 when the plug-in number is zero.

Note: *If the Node type (Field #11) of the reporting node is Access System2000 and the far-end circuit element is 551VST type, then the only far-end alarm Status Codes (Fields # 13-27) reported are: 301, 302, 311, 312, 313, 314, 409, and 410..*

Table E-2 Alarm Archive Record Layout for ESF CSU

Field No.	Description
1	Year, last two digits
2	Month
3	Day
4	Hour
5	Minutes
6	Seconds
7	Circuit element name (i.e., node name [shelf, slot])
8	Node ID number
9	Shelf number, less than or equal to 128 if the alarms reported are set conditions. Otherwise, the alarms reported are clear conditions.
10	Plug-in number 9 (i.e., slot number)
11	Node (or Circuit Element) type: 26 = 551VST List 2 33 = NC/E 32 = SIM 24 = NMC List 2

Field No.	Description
12	Alarm bit 0. See the alarm bit description for your specific type of equipment in the following tables: Table E-4, “551VST List 2 Alarm Bit Definition,” on p ageE-6 Table E-5, “NC/E Alarm Bit Definition,” on pa geE-7 Table E-6, “NC/E Alarm Bit Definition 2,” on pageE-7 Table E-7, “NC/E Alarm Bit Definition 3,” on pageE-8 Table E-8, “SIM Alarm Bit Definition,” on pageE-8 Table E-9, “NC/E Alarm Bit Definition 2,” on pageE-9 Table E-10, “NMC List 2 Alarm Bit Definition 1,” on pageE-9
13 - 27	Alarm bits 1 through 15, or Status Codes
28	Node Name
29 - 33	Not used

Table E-3 Alarm Archive Record Layout for AS2000 and ConnecT1 Plus

Field No.	Description
1	Year, last two digits
2	Month
3	Day
4	Hour
5	Minutes
6	Seconds
7	Circuit element name (i.e., node name [shelf, slot])
8	Node ID number
9	Shelf number
10	Plug-in number 9 (i.e., slot number)

Field No.	Description
11	Node (or Circuit Element) type: 48 = NCC 49 =TAC 56 = CCC
12	Alarm numbers.
13	Node Name
14- 33	Not used

Table E-4 551VST List 2 Alarm Bit Definition

Alarm Bit	Description
0	Far BER exceeded Alarm
1	Far SPAN LOS Alarm
2	Far DTE Low Density Alarm
3	Far LLB or PLB Looped Alarm
4	Far ELB or RLB Looped Alarm
5 - 6	Not used
7	Far CSU Absent Alarm
8	Near BER Exceeded Alarm
9	Near SPAN LOS Alarm
10	Near DTE Low Density Alarm
11	Near LLB or PLB Looped Alarm
12	Near ELB or RLB Looped Alarm
13 - 15	Not used

Table E-5 NC/E Alarm Bit Definitio

Alarm Bit	Description
0	Far BER exceeded Alarm
1	Far SPAN LOS Alarm
2	Far DTE Low Density Alarm
3	Far LLB or PLB Looped Alarm
4	Far ELB or RLB Looped Alarm
5 - 6	Not used
7	Far CSU Absent Alarm
8	Near BER Exceeded Alarm
9	Near SPAN LOS Alarm
10	Near DTE Low Density Alarm
11	Near LLB or PLB Looped Alarm
12	Near ELB or RLB Looped Alarm
13 - 15	Near CSU Absent Alarm

Table E-6 NC/E Alarm Bit Definition

Alarm Bit	Description
0 - 8	Not used
9	CSU Fuse Blown
10 -14	Not used
15	SIM Absent Alarm

Table E-7 NC/E Alarm Bit Definition

Alarm Bit	Description
0 - 8	Not used
9	NC/E Powered Up
10 -15	Not used

Table E-8 SIM Alarm Bit Definition

Alarm Bit	Description
0	Far BER exceeded Alarm
1	Far SPAN LOS Alarm
2	Far DTE Low Density Alarm
3	Far LLB or PLB Looped Alarm
4	Far ELB or RLB Looped Alarm
5 - 6	Not used
7	Far CSU Absent Alarm
8	Near BER Exceeded Alarm
9	Near SPAN LOS Alarm
10	Near DTE Low Density Alarm
11	Near LLB or PLB Looped Alarm
12	Near ELB or RLB Looped Alarm
13 - 14	Not used
15	Near CSU Absent Alarm

Table E-9 NC/E Alarm Bit Definition

Alarm Bit	Description
0 - 8	Not used
9	CSU Fuse Blown
10 - 11	Not used
12	SIM Absent Alarm
13 -15	Not used

Table E-10 NMC List 2 Alarm Bit Definition 1

Alarm Bit	Description
0	Far BER exceeded Alarm
1	Far SPAN LOS Alarm
2	Far DTE Low Density Alarm
3	Far LLB or PLB Looped Alarm
4	Far ELB or RLB Looped Alarm
5 - 6	Not used
7	Far CSU Absent Alarm
8	Near BER Exceeded Alarm
9	Near SPAN LOS Alarm
10	Near DTE Low Density Alarm
11	Near LLB or PLB Looped Alarm
12	Near ELB or RLB Looped Alarm
13 - 14	Not used
15	Near CSU Absent Alarm

Table E-11 NMC List 2 Alarm Bit Definition 2

Alarm Bit	Description
0 - 8	Not used
9	Power Supply A Failure
10	Power Supply B Failure
11	Power Supply C Failure
12	Power Supply D Failure
13	NMC L2 Powered Up
14 -15	Not used

Performance Data Log (Performance Database)

The Performance Log Database stores all of the information about how the DS1 (T1) line is performing. The database archive file uses the LOTUS 1-2-3 import format; each item is separated by a comma. Each line in the archive file represents one interval for one circuit element (Table E-12, “Database Archive Files Formats,” on pag eE-10). From left to right, the data items on each line are:

Table E-12 Database Archive Files Formats

Item	User data	EQPT data	Additional data
1	Interval timestamp YEAR	Interval timestamp YEAR	Interval timestamp YEAR
2	Interval timestamp MONTH	Interval timestamp MONTH	Interval timestamp MONTH
3	Interval timestamp DA	Interval timestamp DAY	Interval timestamp DAY
4	Interval timestamp HOUR	Interval timestamp HOUR	Interval timestamp HOUR
5	Interval timestamp MINUTE	Interval timestamp MINUTE	Interval timestamp MINUTE
6	Circuit Element Name	Circuit Element Name	Circuit Element Name
7	Node ID number	Node ID number	Node ID numbe
8	Circuit Element Shelf Numbe	Circuit Element Shelf Number	Circuit Element Shelf Number

Item	User data	EQPT data	Additional data
9	Circuit Element Slot Number	Circuit Element Slot Number	Circuit Element Slot Number
10	Circuit Element Side	Circuit Element Side	Circuit Element Side (numeric
11	Errored Seconds	Errored Seconds	Out of Frame Seconds
12	Unavailable Seconds	Unavailable Seconds	Loss of Signal Seconds
13	Bursty Errored Seconds	Errored Seconds-Line	AIS seconds
14	Severely Errored Seconds	Out of Frame Seconds	BER Seconds
15	Loss of Frame Count	DTE Low Density Seconds	Remote AIS
16	Errored Seconds-Line	BER Alarm Seconds	Loss of Frame Seconds
17	Severely Errored Framing Seconds	Reserved	Reserved
18	AS2000 551VST type: Out of Frame Seconds	Reserved	Reserved
19	Reserved	Reserved	Reserved
20	Reserved	Reserved	Reserved

If you change the node ID number (item 7) or node name (item 6) by Access Manager's configuration commands, the archived data will also change as of that date and time. For this reason, exercise care when trying to correlate data over extended intervals. If archive data is used as input for reports, unexpected changes in node definitions could produce undesired results. For items 11 through 20, the following codes apply:

- 0 - 900 Able to access, not available
- 1 - Attempt to access, unable to get circuit/element data
- 2 - Not available by design
- 3 - Data collection disabled

For 551VST type circuit elements, Item 18 of the User Performance Data file becomes Out of Frame Seconds, only when the EQPT and Additional Performance data files do not exist. The User, EQPT, and Additional data files all exist for AS2000 circuit elements.

Note: *When the Performance Database is archived, the Circuit Element Name is labelled with the node name [shelf, slot].*

Performance Data Log Records

This section describes the interpretation of records in the Performance Data Log. This interpretation is the same whether you are examining an archived log that has been saved to a file or a current log in the *Circuit Elements Detail* Screen (called up through the *Database Access* Menu).

Figure E -1, "Circuit Element Detail Menu (no data available)," on page E-12 shows a typical *Circuit Elements Detail* Screen. The following lines store the different types of information. Lines 4 through 11 present Performance Data Log records, one record per line (see Tab leE-12, "Database Archive Files Formats," on page E -10). Each column presents different information, see below.

- Column 1 through 2 are presented as the Date and Time
- Column 3 is the circuit element's name.
- Column 4 through 11 are the performance data registers for each 15-minute interval in the reporting time range.

Dots (...) in the performance data register fields indicate that no data is available for that time interval. (Fig u reE-1, "Circuit Element Detail Menu (no data available)," on page E -12).

Figure E-1 Circuit Element Detail Menu (no data available)

Circuit Element Detail

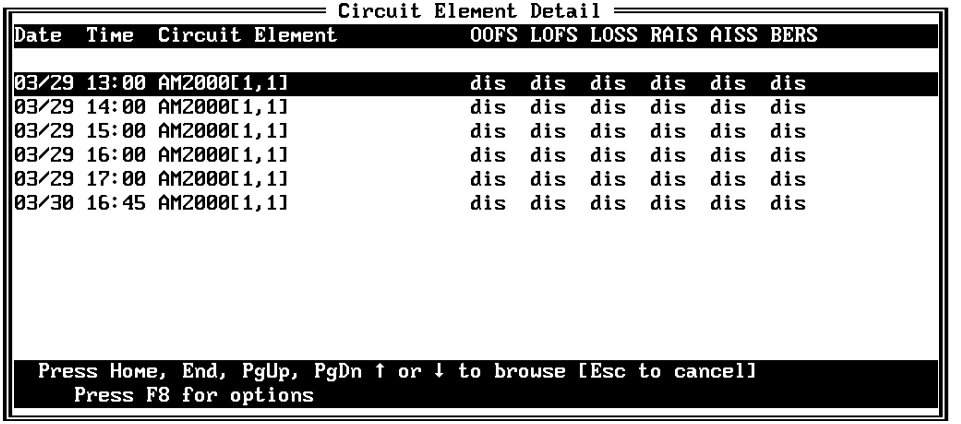
Date	Time	Circuit Element	ES	UAS	BS	SES	LOFC	ES-L	SEFS	OOFS
01/23	10:00	551VST LIST 2	...	...	...	...	...	...	...	...
01/23	10:15	551VST LIST 2	...	...	...	...	...	...	...	...
01/23	10:30	551VST LIST 2	...	...	...	...	...	...	...	...
01/23	10:45	551VST LIST 2	0	900	0	0	1	0	10	0
01/23	11:00	551VST LIST 2	0	900	0	0	0	0	0	0
01/23	11:15	551VST LIST 2	0	900	0	0	0	0	0	0
01/23	11:30	551VST LIST 2	0	841	0	0	0	3	0	0
01/23	11:45	551VST LIST 2	142	19	24	0	0	152	0	0
01/23	12:00	551VST LIST 2	139	0	0	0	0	139	0	0
01/23	12:15	551VST LIST 2	138	0	0	0	0	139	0	0

Press Home, End, PgUp, PgDn, ↑ or ↓ to browse [Esc to cancel]
Press F8 for options

N/A (Not Applicable) in the performance data register fields indicates that the circuit element does not support that type of data collection.

"dis" indicates that the collection of performance data in the slot was disabled for the period displayed. (FigureE- 2, "Circuit Element Detail Menu (slot disabled)," on pag eE-13)

Figure E-2 Circuit Element Detail Menu (slot disabled)


Circuit Element Detail
Date Time Circuit Element OOFS LOFS LOSS RAIS AISS BERS
03/29 13:00 AM2000[1,1] dis dis dis dis dis dis
03/29 14:00 AM2000[1,1] dis dis dis dis dis dis
03/29 15:00 AM2000[1,1] dis dis dis dis dis dis
03/29 16:00 AM2000[1,1] dis dis dis dis dis dis
03/29 17:00 AM2000[1,1] dis dis dis dis dis dis
03/30 16:45 AM2000[1,1] dis dis dis dis dis dis
Press Home, End, PgUp, PgDn ↑ or ↓ to browse [Esc to cancel]
Press F8 for options

Note: *All 15-minute intervals are not displayed or recorded. The explanation for unrecorded is:*

- If a performance data type (User, Additional, or EQPT) is disabled, "dis" records are created to mark the beginning and end of the disabled period. During the disabled period, records are created every 12 hours on the polling hour. No other "dis" records are created.
- If a performance data type is all zeros for all its registers, "0 records" are created to mark the beginning and end of the all-zeros period. During the period when all registers remain all zeros, records are created every 12 hours, on the polling hour. No other "0 records" are created.

- If a record type contains non-zero data or has no data (i.e., the data is missing), "... records" are created. In either case, a data record for every 15-minute interval is created. The data could be missing for a number of reasons (see Fig u reE-1, "Circuit Element Detail Menu (no data available)," on page E-12):
  - Connection to the node could not be made.
  - Connection to the node was made, but access to the circuit element could not be made.
  - The registers in the circuit element were reset, either manually or by powering down the CSU within in the last 12 hours.

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